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# COMPLETE

# GEOGRAPHY

BY

ALEX EVERETT FRYE

AUTHOR OF "CHILD AND NATURE," "BROOKS AND BROOK BASINS,"
"PRIMARY GEOGRAPHY," ETC.

E. P. Cubberley.

BOSTON, U.S.A., AND LONDON
GINN & COMPANY, PUBLISHERS
1895

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# PREFACE.

**Commerce.** A work on geography that seeks to lay a broad basis for the study of nations must throw a strong search-light upon their commercial relations.

Commerce and the related industries take a leading place in this book, — those of our own country being illustrated by twenty-two colored maps prepared expressly for this work.

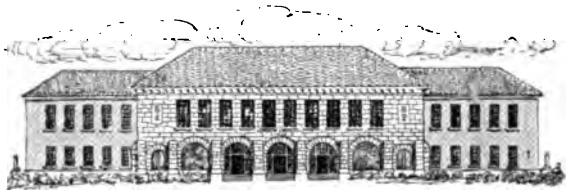
The intelligent study of a country's natural resources must be based on knowledge of its physical features. For this reason the surface-forms and the climate of the various parts of the world receive full treatment in the text, the maps and the pictures. The natural regions of the United States are made to serve as a basis for the comparative study of other lands.

**Order of Lessons.** Though most teachers using this book will doubtless present the lessons in the order in which they appear, yet those who wish to complete the study of the United States in detail, before showing the broader relations of our country to other lands, can readily do so. The work is so arranged that pupils can go directly from the early lessons on the physical features and resources of our country (*pages* 30 *to* 52) to the study of its people, its government and its industries (*pages* 123 *et seq.*).

**Sizes of Type.** The subject-matter which needs the most careful study is in large type. The explanatory and descriptive matter in small type does not call for close study, but may be used for supplementary reading. Teachers who wish to shorten the course in geography can easily do so by laying little stress on the notes in small type.

**Illustrations.** Nearly all the pictures in this book were engraved directly from photographs. To the selection of subjects for the photographs, the author has given fully as much time and care as to the text itself. The aim has been to present *characteristic forms* that are educative. Many of the views are from the Gardner collection in Harvard University.

**Spelling of Geographic Names.** This book follows the rulings of the *United States Board on Geographic Names*, — the highest authority in our country.



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**Study and Reference Maps.** All teachers of geography have felt the need of *simple* study maps and *full* reference maps. No single map can serve both purposes. If it is simple enough for study, it is of little value for reference. For this reason, two series of maps are used in this book, — the one containing such details as are needed in connection with the text; the other being the most complete series of reference maps ever placed in any text-book. Among the latter, in the supplement, are several historical maps showing geographical discoveries, Greece in the time of Pericles, Italy in the time of Augustus, Palestine in one of the most important periods of Biblical history.

**Teachers' Manual.** The suggestions in the *Teachers' Manual* are the outgrowth of experience in the class-room.

**Acknowledgments.** William Morris Davis, Professor of Physical Geography in Harvard University, has given very valuable assistance in the preparation of this work. The treatment of the atmosphere and the elementary land-forms is based on manuscripts of Professor Davis. He has also given many broad criticisms on other parts of the work.

The author takes pleasure in expressing his gratitude to Mr. Justin H. Smith, of Boston; Mr. Cyrus C. Adams, of New York; and Mr. Frank F. Murdock, of Bridgewater, Mass., for many helpful criticisms; — also, to Mr. J. F. Richardson, of Boston, for the care which he has bestowed upon the wood-engravings.

The relief maps were modeled under the direction of the author, by Miss Gertrude Beatrice Wright, of the Normal Art School, Boston. The industrial maps were drawn by Mr. Henry Gannett, Chief Topographer of the United States Geological Survey.

ALEX E. FRYE.

BOSTON, May, 1895.

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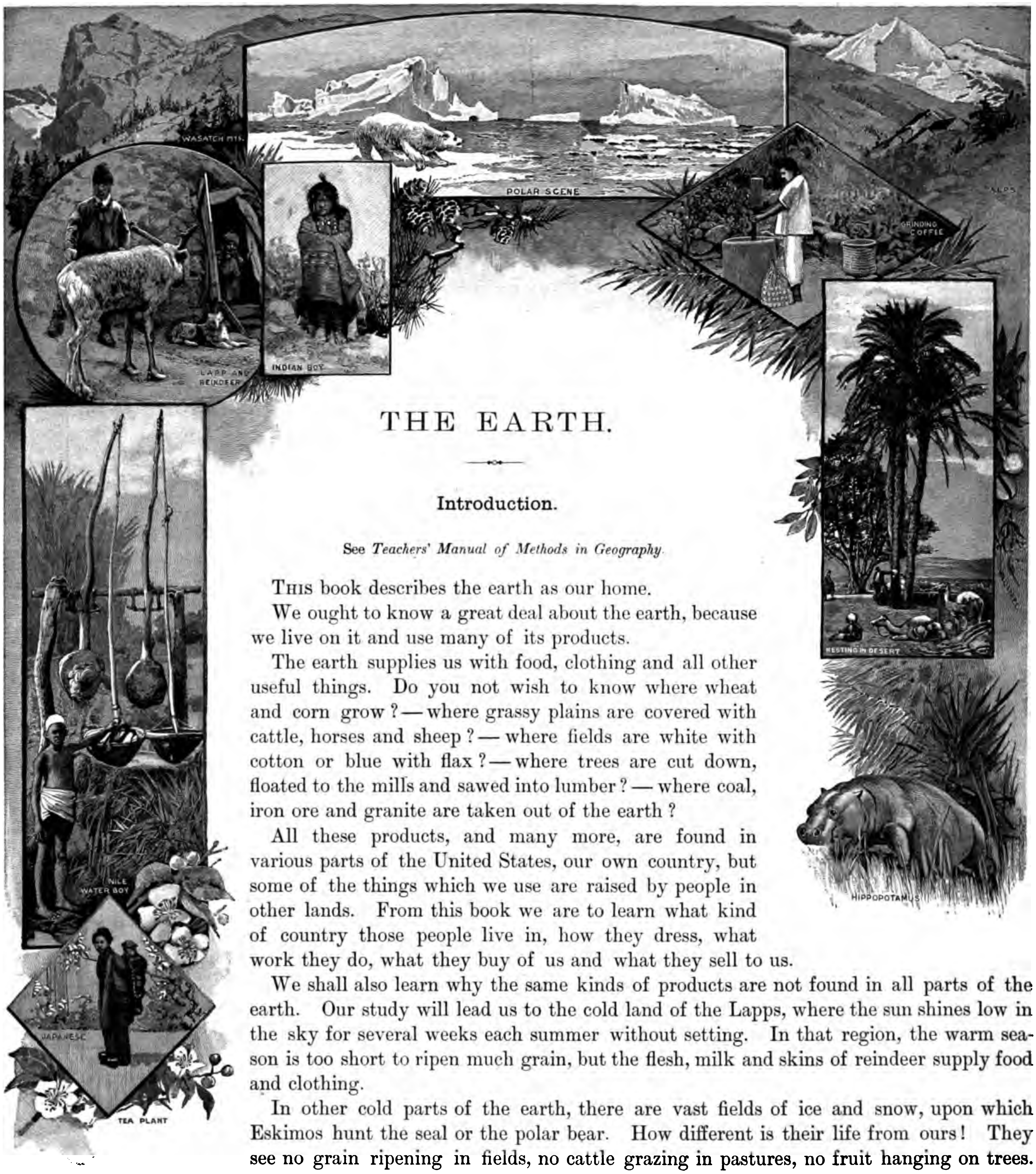


# THE EARTH.

## Introduction.

See *Teachers' Manual of Methods in Geography.*

This book describes the earth as our home.

We ought to know a great deal about the earth, because we live on it and use many of its products.

The earth supplies us with food, clothing and all other useful things. Do you not wish to know where wheat and corn grow? — where grassy plains are covered with cattle, horses and sheep? — where fields are white with cotton or blue with flax? — where trees are cut down, floated to the mills and sawed into lumber? — where coal, iron ore and granite are taken out of the earth?

All these products, and many more, are found in various parts of the United States, our own country, but some of the things which we use are raised by people in other lands. From this book we are to learn what kind of country those people live in, how they dress, what work they do, what they buy of us and what they sell to us.

We shall also learn why the same kinds of products are not found in all parts of the earth. Our study will lead us to the cold land of the Lapps, where the sun shines low in the sky for several weeks each summer without setting. In that region, the warm season is too short to ripen much grain, but the flesh, milk and skins of reindeer supply food and clothing.

In other cold parts of the earth, there are vast fields of ice and snow, upon which Eskimos hunt the seal or the polar bear. How different is their life from ours! They see no grain ripening in fields, no cattle grazing in pastures, no fruit hanging on trees.

This book describes wide regions of shifting sand, where no rain falls and no plants grow, except near a few springs. There the people travel mostly on the backs of camels.

Do you know how tea leaves are dried and how silk is woven into fine cloth? You will learn how, when you read about the yellow people in Japan and China.

There are warm lands where coffee berries and many kinds of spices grow. Do you not wish to learn about the people who send us coffee, cloves and nutmegs? Every day as we study this book and look at its pictures, we shall learn something about the earth, — its forms of land and water, its plants, its animals or its people.

*Geography treats of the earth as the home of man.*

## 1. Form and Size of the Earth.[1]

The earth is a great ball of land and water, surrounded by a shell of air.

We see so small a part of the earth at a time that it does not look like a ball, but there are many proofs that the earth is round. Here are a few of them:

America.

The Old World.

1. Many persons have gone around the earth.
2. As ships sail out to sea, their hulls are often lost to sight while their sails are clearly seen.
3. When travelers go day after day towards the north or the south, new stars rise over the horizon before them, while the stars behind sink beneath the horizon.
4. Sometimes the earth moves between the sun and the moon and casts a shadow on the moon. The edge of this shadow always looks like part of a circle.

Coral — ½.

The sun and the moon are round, like the earth. The moon is smaller than the earth, but the sun is many times larger.

The shadow of the earth on the moon is called an *eclipse of the moon.* There may also be an eclipse of the sun, when the moon is between the earth and the sun.

The great body of salt water which surrounds the land is called the *sea.* Various parts of the sea are known as *oceans.* The oceans lie in broad hollows on the earth.

Sea-Urchin — ½.

The two maps above show the land and the water on both sides of the earth.

The earth is so large that the distance from side to side, through the center, is nearly 8000 miles. The greatest distance around the earth is about 25,000 miles. Many millions of people liv on the earth, and yet a large part of the land is not used

If a train of cars were to travel day and night at the rate o thirty miles an hour, how long would it take to go 25,000 miles ?

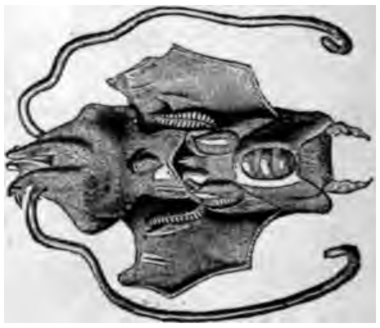
## 2. The Land and the Sea.

The greater part o the earth is a mass o rock. On the land mos of the rock is covere with soil. Fine mud, o *ooze*, covers the rock under the sea.

Many parts of th land do not rise ver high above the sea, bu other parts are lofty an rugged. Some mountains rise higher tha most of the clouds whic we see, — even four or five miles into the air.

Most parts of the sea *near the land* are shallow Far from the shores the sea is in many places tw miles deep, and in some places the bottom is four or fiv miles below the surface.

The land and the surface of the sea have light by da and darkness by night. They have also warm and cold seasons. No sunshine reaches the deep parts of the sea. The deep water is always cold and dark.



Deep-Sea Spirula — ⅓.

The land has many valleys and mountains, but a large part of the sea-bottom is a great smooth plain.

The wind blows sand and dust over the land and also makes waves on th surface of the sea, but the deep sea i very still. Part of the rain falling o the land feeds brooks and rivers whic carry or *wash* loose soil down the slope and help to wear valleys in the land Thus the form of the land is slowl changed.

Sponge — ¼.

Nearly all the soil which is washe into the sea settles in the shallow wate near the shores. The smooth bottom o the deep sea hardly changes at all, fo there are no streams to wear valleys i it, and very little soil from the lan reaches these quiet waters.

---

[1] For pronunciation of difficult words, see the *Vocabulary* in the Supplement.

Animals and plants, or parts of them, are often buried in the layers of sand and mud which are formed in the sea. During long ages, many layers form and gradually harden to rock. The remains of animals or of plants bedded in the rock are called *fossils*.

Plants and animals of many kinds live on the land. Seaweeds, fish and other kinds of creatures abound in the shallow waters near the seashores, but the cold and dark depths of the sea have only a few, if any, plants and not nearly so many kinds of animals as live either in the shore waters or on the land.

A Fossil Shell.

Fish abound in many rivers and lakes. Some kinds of fish are found in fresh water only, but others from the salt water go into the rivers to *spawn*, or deposit their eggs.

Some of the small pictures on this page and that opposite show a deep-sea fish and a few other forms of deep-sea life.

We shall study the land more than the sea, because we live on the land and get from it most of the things we use.

### 3. Directions.

In our country all shadows cast by the sun at midday point due north. When you stand with your back to the midday sun, you face the north. Your back is then towards the south.

Have you ever seen the *north star?* Do you know how to find it by means of the two stars called *pointers*, in the "Dipper"?

*North* is the direction along the earth's surface towards the north star. *South* is the opposite direction, towards the midday sun.

Which is the north side of your schoolroom? Which is the south side? Name some objects north of your schoolhouse. Name some objects south of it.

When you face the north, east is on the right side, and west is on the left.

When you face the south, which direction is on the right? Which is then on the left?

Only twice each year[1] the sun rises due east of us and sets due west, but it always rises in the *eastern* part of the sky and sets in the *western* part.

Name some objects east of your schoolhouse. What street near by runs about east and west?

Point midway between north and east. This direction is called *northeast* and may be written N. E. Where will you look for *southeast?* Where will you look for S.W.? For N.W.?

Here is the picture of a *mariner's compass*. Under its glass cover is a round card, naming the *points of the compass*, — N., S., E., W., N. E., S. E., etc. On the under side of the card is a steel magnet in the form of a needle or bar that swings on a pivot.

Mariner's Compass.

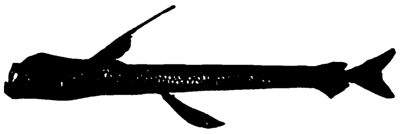
The needle generally points almost north and south.[1]

By means of the compass, the sun or the stars, sailors can at all times tell the direction in which they are moving. Without this simple magnet-needle, the task of steering vessels from port to port would be very difficult.

### 4. Directions on the Earth.

The earth is always turning round like a ball spinning as it flies through the air, but the earth turns only once in twenty-four hours, — a day and night.

The sun can light and warm only a little more than one half[2] of the earth at a time. As the earth turns, or *rotates*, some parts of it are turning into the sunlight while other parts are turning away from it. One side of the earth has day while the other side has night.


Deep-Sea Fish — ⅙.

As the earth rotates, its surface moves from west to east. The sun seems therefore to "rise" in the east and "set" in the west.

Waves on the Seashore.

---

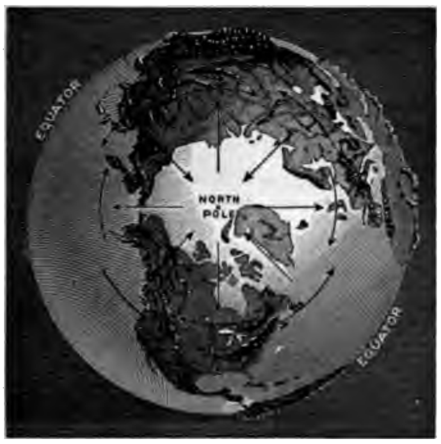
[1] About March 21 and September 22.

[1] The needle points to the *magnetic pole* of the earth. Find this pole on the colored map of North America.

[2] If there were no air the sun would light exactly one half of the earth at a time. There would then be no twilight, and the sun would not be visible after it had actually sunk beneath the horizon line.

Bright daylight would be tiresome, if it lasted all the time, with no dark hours for rest and sleep. Endless night would be cold and dismal, if there were no sunshine to heat and light the earth.

Far away in the north, there is a point on the earth, known as the *north pole.* It is under the north star, which is often called the *pole star.* Opposite the north pole, on the other side of the earth, there is a point called the *south pole.*



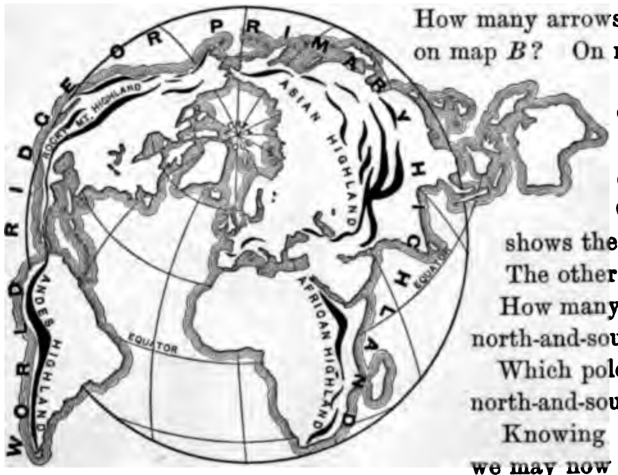
Map A.

The word *pole* means *pivot*, or point on which a thing turns. The earth does not rest on anything, but turns in space *as if* held by a line running from pole to pole. We can *think* of such a line, and we will call it the *axis* of the earth.

No person has yet reached the poles. They are in regions of ice and snow.

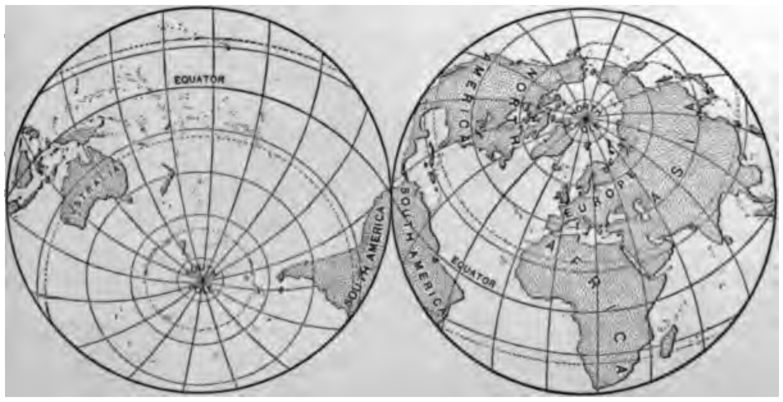
In our land every midday shadow points towards the north pole, and so all north lines that we may imagine on the earth meet at that point. Going in the opposite direction, all south lines meet at the south pole.

East-and-west lines go round the earth in circles. The largest of these circles is midway between the poles and is called the *equator*, because it divides the surface of the earth into two *equal* parts. All east-and-west lines run parallel with the equator. When we face the north pole, *east* is along the lines to the right, and *west* to the left.



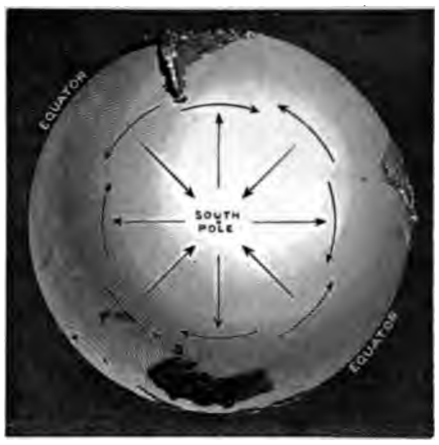
Map D.
Key to the World Ridge Map, page 5.

Of course there are no real circles to be seen on the earth, but we may imagine such lines and name or number them. We shall find that these lines are very useful in helping to locate places on the globe. The equator is far south of us. If we were near it we could see the sun overhead, or nearly so, at noon every day. The regions near the equator have no winter. The hot season lasts all the year. Snow and ice are not found there, except on the tops of high mountains.



Water Hemisphere. Land Hemisphere.

By climbing any very high mountain near the equator, a person may find the same changes in climate as in going from the equator to either polar region.



Map B.

The lands in the hot belt teem with life. Dense forests cover many parts of the surface. Birds, insects and large animals also abound. In later lessons we shall read about some of these animals.

We shall see maps of the earth in many positions, but we shall always be able to tell the directions on them, if we remember that north and south are towards the poles, while east and west are parallel with the equator.

How many arrows on map *A* point north? How many point south? Which arrows point north on map *B*? On map *C*?

Which arrows are flying south on map *B*? On map *C*? How many arrows on map *A* point east? Which fly east on map *B*? On map *C*?

Which arrow points west on map *A*? On map *B*? On map *C*?

A map of half a globe, or *sphere*, is called a *hemisphere*. *Hemi* means *half*. One of the little hemispheres on this page shows the side of the earth having the most water. The other shows the side having the most land.

How many lines on the *Land Hemisphere* are drawn north-and-south?

Which pole is not shown on map *D*? How many north-and-south lines are shown on this map?

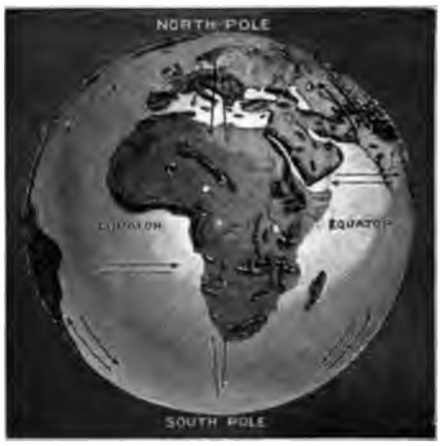
Knowing how to tell the directions on the earth, we may now study the positions of the great bodies of land and water.

## 5. The World Ridge or Primary Highland.

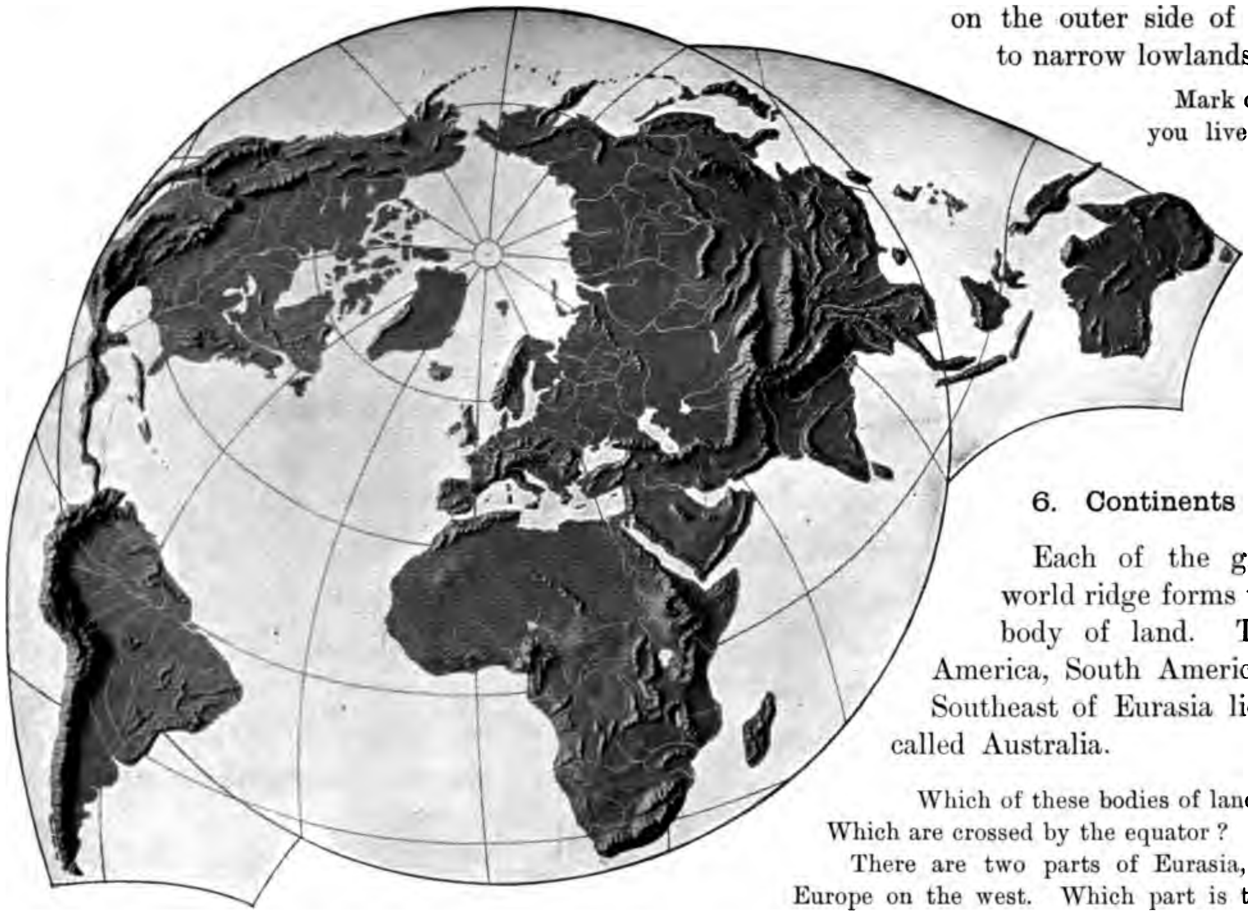
Most of the lands on the earth are in large bodies, instead of being scattered in small islands.

The land is not evenly distributed over the earth. Most of it is north of the equator and therefore much nearer the north pole than the south pole.

About one fourth of the earth's surface is land, — the rest is water. Only a small



Map C.



Map showing the World Ridge.

part of the surface south of the equator is land. The sea is not wholly cut into separate oceans by the lands, but it spreads in one large body around them.

Through the great bodies of land, we can trace a long chain of highlands, somewhat in the shape of a horseshoe. We will call this chain of highlands the *world ridge*, or the *primary highland of the world.* The greater part of the world ridge consists of long and wide plateaus, broken by mountains and valleys. In many places it is hundreds of miles in width. Some parts of the world ridge are not very high.

On both sides of the primary highland, the land slopes away to the shores and there dips beneath the sea. Most of the longer slopes are on the inner side of the horseshoe-shaped highland.

These slopes make wide plains between the primary highland and the sea. In many places the shorter slopes, on the outer side of this highland, descend to narrow lowlands along the shores.

Mark on the map the place where you live. On which side of the equator are the ends of the primary highland? In how many places does the equator cross the highland? Which part of the primary highland is nearest the north pole? Nearest the south pole?

## 6. Continents or Grand Divisions.

Each of the great highlands in the world ridge forms the backbone of a large body of land. These lands are North America, South America, Eurasia and Africa. Southeast of Eurasia lies a great body of land called Australia.

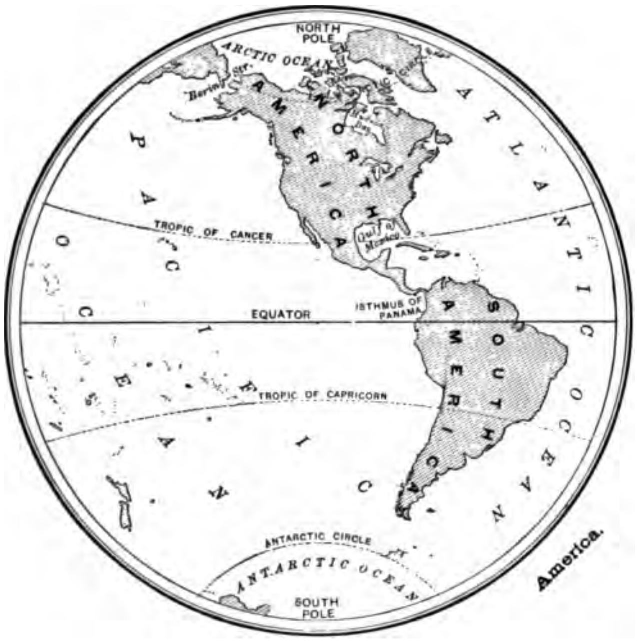
Which of these bodies of land are north of the equator? Which are crossed by the equator?

There are two parts of Eurasia, — Asia on the east, and Europe on the west. Which part is the larger?

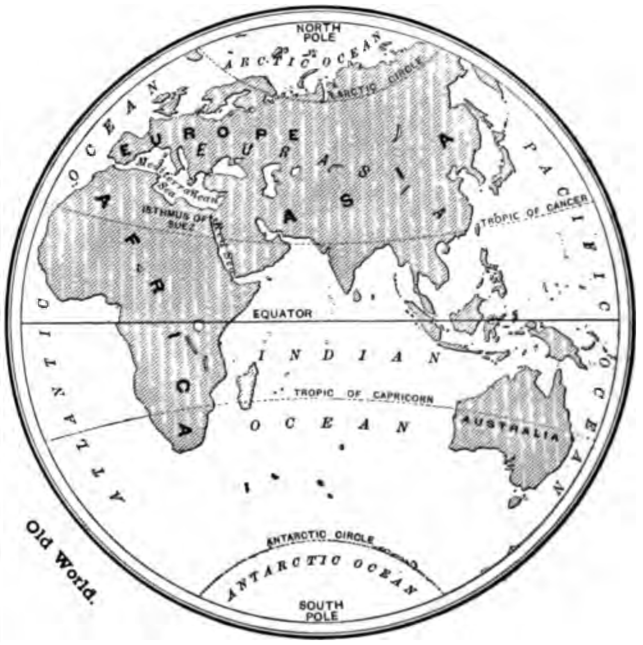
North America, South America, Europe, Asia, Africa and Australia are called *continents*, or *grand divisions.*

Which of these continents is wholly south of the equator?

Bering strait cuts through the primary highland and separates the *Old World* from *America*, or the *New World.*



America.



Old World.

Which continents are in America? Which are in the Old World? What isthmus connects the two parts of America? Where is the isthmus of Suez? What seas does it separate? Which is the larger, — Africa or Eurasia? Africa or North America? Australia or North America? Which continent is farthest from your home?

## 7. The Oceans.

**The oceans cover about three fourths of the earth's surface and wholly or partly separate the continents from one another.**

We may think of the vast area of water around the south polar regions as the main body from which all other parts of the sea extend like arms. Thus, the Pacific is a broad arm lying partly between America and the Old World, on the outer side of the primary highland. The Atlantic ocean is a long and crooked arm reaching northward between America and the Old World, on the inner side of the primary highland. The Arctic ocean is like a large gulf at the northern end of the Atlantic ocean. The Indian ocean is a short but broad arm partly between Africa and Australia. The Antarctic ocean spreads round the south pole.

What three oceans extend northward from the Antarctic ocean?

Which ocean is east of America? Which is west of America? Which of these two oceans is the larger?

On which side of the Old World is the Atlantic ocean? On which side is the Pacific ocean?

What small ocean adjoins the Atlantic on the north? Which pole is near the middle of that ocean?

What ocean is south of Asia? What lands partly surround that ocean?

Name the continents which border on the Pacific ocean; on the Atlantic ocean; on the Arctic ocean. What oceans border on North America? On Asia? Australia? Africa? South America?

Let us now learn how the rain, the rivers, the winds and the ice change the surface of the continents.

## 8. The Waste of the Land.

As the weather changes from warm to cold, or from wet to dry, all rocks exposed to the air and the rain slowly decay, but many years may be needed to loosen only a few grains. As rocks decay or crumble they are said to *weather*.

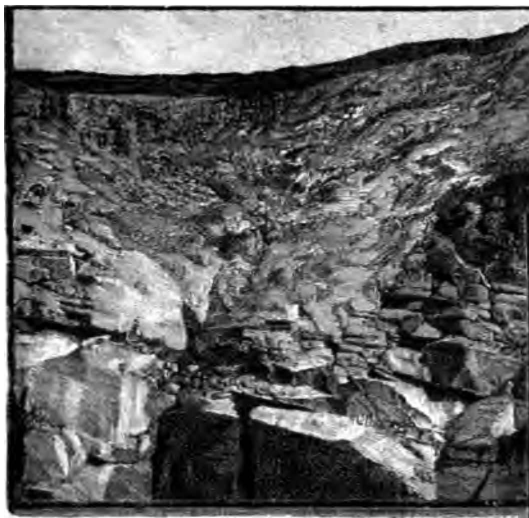
The loosened parts weather finer and finer, forming *rock waste* or *land waste*. In some places the rock waste is thirty or forty feet in depth, but in most places it is thinner. Finely crumbled rock mixed with plant and animal matter is called *soil*. Year after year, plants grow and decay, while myriads of insects and worms live and die in the fine rock waste. The remains of the plants, the insects, the worms and other creatures mingle with the fine rock waste to form the dark rich topsoil. The roots of most plants grow in the topsoil. When it is moist, the plants take from it part of the food needed for their growth.

If rocks were so firm that they would not weather, the plants which require soil could not grow. There would be no trees to supply lumber or fuel, and no cotton fiber to weave into cloth.

In lands that have but little rain and frost, rocks weather very slowly. In our own country, where rains are common and where winters bring frosts and thaws, the decay of rocks is more rapid.

The monument shown in the picture stood for thousands of years in a warm land, where rain seldom falls. There its surface showed but few signs of decay.

Not many years ago, this monument was brought to our country. The rock then crumbled so fast that it became necessary to protect the surface from the weather.



Weathered Rock.

This monument is called *Cleopatra's Needle*. It was brought from Egypt and now stands in Central Park, New York.

### 9. Rainfall.

Vapor rises from the oceans, and the winds carry it about. The vapor forms clouds from which rain sometimes falls on both the continents and the oceans.

On steep hillsides, much of the rainfall is quickly shed into rills, brooks or larger streams, washing away some of the surface soil. The streams are thus filled with rapid currents of muddy water and often overflow their banks.

On flat land, a large part of the rain sinks into the ground, instead of running away. If the soil is loose and sandy, almost all the rainfall sinks into it.

When the rain ceases and the sky clears, some of the water which is then left on the ground rises in vapor. The drying of the ground is often quickened by winds and sunshine. Water that changes to vapor is said to *evaporate*.

In windy summer weather, many of the large clouds which are seen on the day after a rain are made of water that has evaporated from the ground.

Rain water that stands till it evaporates does not help in washing soil down the slopes. The water which soaks into the ground does but little of that work. The rain water which runs off the surface washes away the greatest amount of soil.

### 10. Springs and Streams.

Water that soaks into the ground is called *ground water*. It creeps slowly through the soil towards the lower land. It is the ground water which makes the soil of meadows wetter than that of hillsides. Ground water often creeps slowly through loose rock beneath the soil. In this way the water may travel underground for many miles.

In some dry countries, pipe wells are driven or sunk to reach a supply of ground water. These wells are often drilled through layers of rock, beneath which the water is creeping.

Water may often be seen coming out of the ground through little crevices, thus forming *springs*. Many springs are found at the foot of hillslopes. Others appear along borders of brooks or rivers. In many places the ground water is found rising in the beds of streams or lakes.

The spring which is farthest up the valley trough is called the *source*, or *head*, of the stream that it feeds.

Surface water is often muddy, but nearly all ground water is clear, because it moves too slowly to carry waste. Spring water is therefore much better than surface water for drinking.

Wells also are supplied by ground water.

Most springs flow so slowly that the supply of ground water from one rain lasts till rain again falls. Such springs flow in both rainy and fair weather. In long dry spells, or *drouths*, springs yield less and less water, or they may even cease to flow. The streams then become very low, or perhaps dry up. When soil is frozen, water cannot sink into it. In lands that have long freezing seasons, plentiful rains are needed in autumn to give a good flow of water before the severe frosts harden the soil.

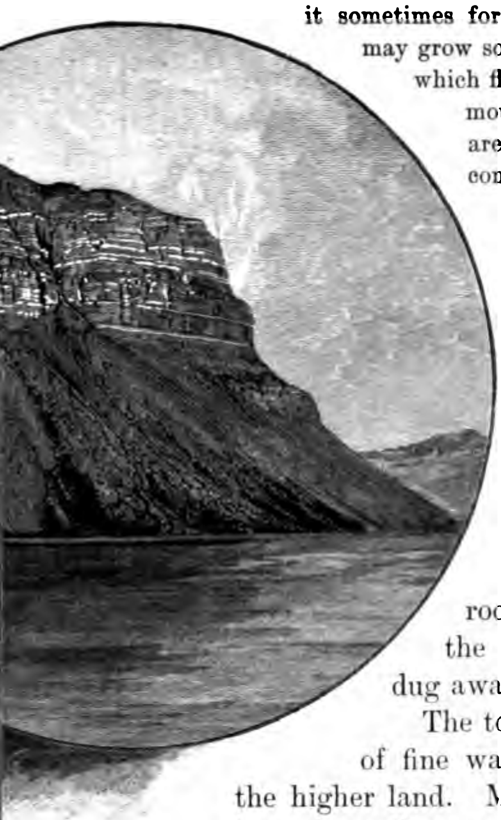
Rainy Weather.

Dry Weather.

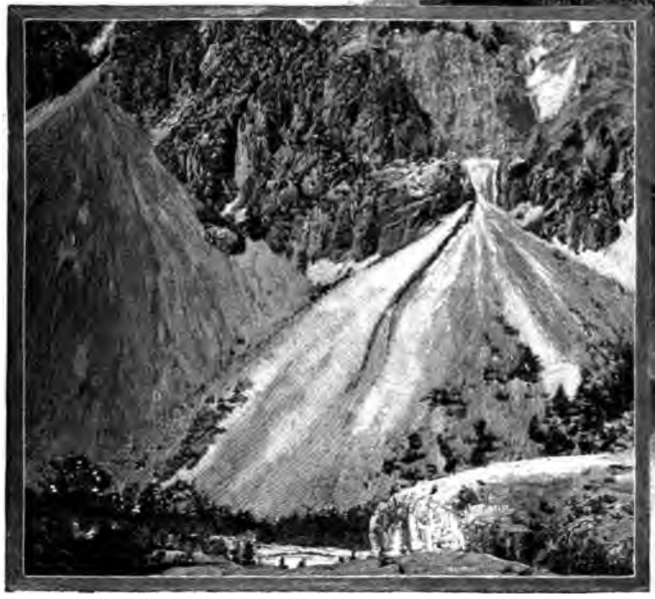
In winter, when the ground is frozen, the rain water and the melting snow run quickly to the streams and often flood them. They then cut away their banks and wash the rock waste down their valleys, spreading it over the flooded lands or even carrying it to the sea. The flooded rivers often carry down large blocks of ice and trunks of trees. These do much damage in breaking down bridges and clogging the beds of the streams.

## 11. Land Waste on the Way to the Sea.

We have learned that in rainy weather the surface waste is washed down the slopes, but in both wet and dry weather the whole sheet or layer of soil and coarser rock waste is very, very slowly creeping downhill. With every change from wet to dry, from warm to cold, or from frost to thaw, the rock waste is weathering finer and finer as it moves down the slopes. The fine and light surface waste creeps fastest. The undersoil scarcely moves, and the firm rock beneath stands still. The steeper the slope, the faster the waste creeps.

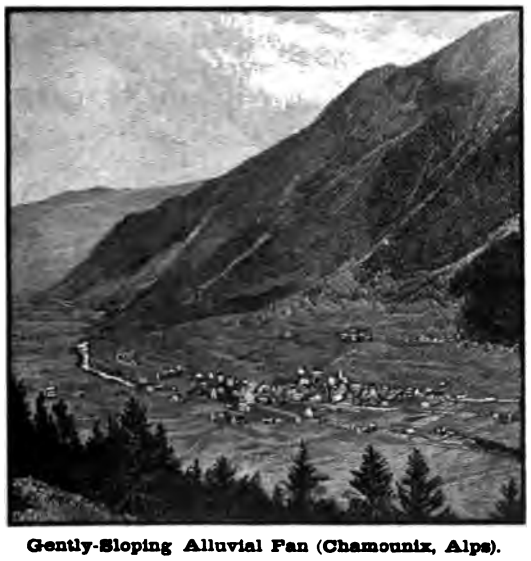


Rock Waste at Foot of Cliff (Spitzbergen).



Steep Alluvial Fan.

On many steep hillsides the fine waste creeps and washes away nearly as fast as it forms, and only the coarser rock waste is left. The roots of grass and trees do much to prevent the soil from being rapidly carried away.



Gently-Sloping Alluvial Fan (Chamounix, Alps).

On rough hills, there are often rocky ledges from which the waste is washed or blown nearly as soon as it forms. On some mountains, bare crags cover much of the surface. The coarse rock waste rolls down, making steep slopes at the foot of the crags. The finer waste is washed into the lowlands.

When waste is washed down from gulleys on mountain slopes, it sometimes forms great fan-shaped heaps. These may grow so large that they push away streams which flow in the valleys at the base of the mountain slopes. These heaps of waste are called *alluvial fans*. They often become very large in dry countries where the streams are not strong enough to wash the waste down the valleys. Coarse waste forms steep alluvial fans, but the slopes are more gentle where the waste is fine.

On gentle slopes, the soil moves very slowly and becomes deep and fine. There the rocks may decay for many feet below the surface, thus making plenty of soil for the roots of plants. In order to reach the firm rock, the waste must be dug away to a great depth.

The topsoil in valleys consists mainly of fine waste that has been washed from the higher land. Most of the ground water flows into the valleys and helps to keep the soil moist. For these reasons many of the best farms are in lowland valleys.

## 12. Work of the Winds.

Waterspout.

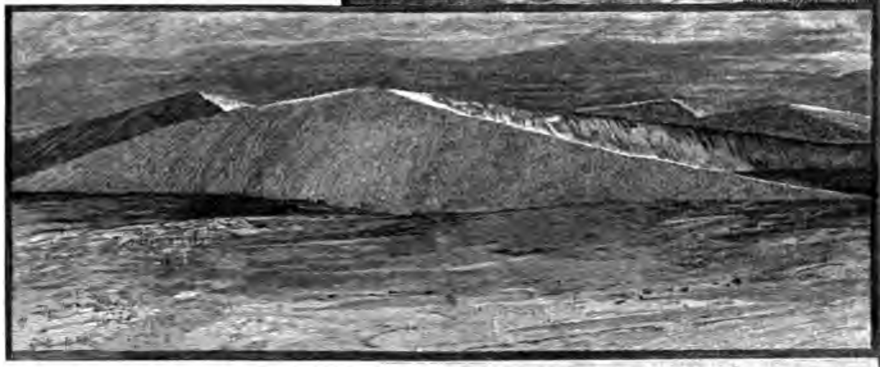
Strong winds cannot reach soil that is covered with grass or trees, but in dry lands where there are but few plants the winds sweep over the ground and scatter fine rock waste far and wide. Coarse sand is drifted along like dry snow in winter.

The particles of sand are blown against one another and against bare rocks. Thus both the sand and the rocks are ground to dust. In deserts, where the drifting sand is plentiful, it gathers in hills called *dunes*. Some of these sandy hills are from three hundred to six hundred feet high. Dunes are also found on sandy shores. Waves throw sand upon the beaches, and the winds may then blow it inland. Fields, forests and villages are sometimes buried by drifting sand.

Desert whirlwinds take up fine dust, which may then be blown many miles away. Some of the dust falls into the sea, and the winds thus help along the work of rivers.

Sails of ships on the ocean west of the desert of Sahara are often covered with reddish dust from that barren region. Locate this great desert on the map of Africa.

Whirlwinds at sea are generally formed under heavy clouds from which whirling funnel-shaped spouts seem to descend and join the spray raised from the waves. The long whirling funnels are called *waterspouts*.


Desert Dunes.

Waterspouts occur most frequently over the oceans near the equator, but they are also seen east of our country, over the warm parts of the ocean. The whirling winds of waterspouts are sometimes strong enough to dismast vessels.

Winds not only blow dust and sand about, but they also sweep over the sea and make waves. The waves which roll against the land wash stones and sand back and forth on the seashore, grinding them very fine.

Winds mix the different parts of the atmosphere and keep it fresh and pure. They carry water vapor from the sea to the land, and thus help to determine which parts of the land shall yield grain and fruits and which parts shall remain barren.

Iceberg.

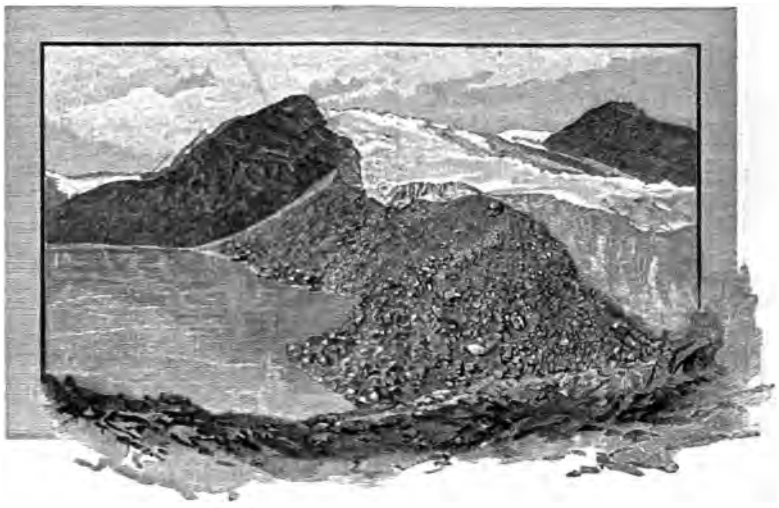
Winds scatter the seeds of some kinds of plants, and also aid in the flight of birds by lifting them, somewhat as kites are lifted. If it were not for currents of air there would be no sailing-vessels nor windmills.

Winds are sometimes so violent that they wreck vessels and blow down trees and buildings. In later lessons we shall learn more about the work of winds.

Wind-Swept Desert of Sahara.

### 13. Snow and Ice.

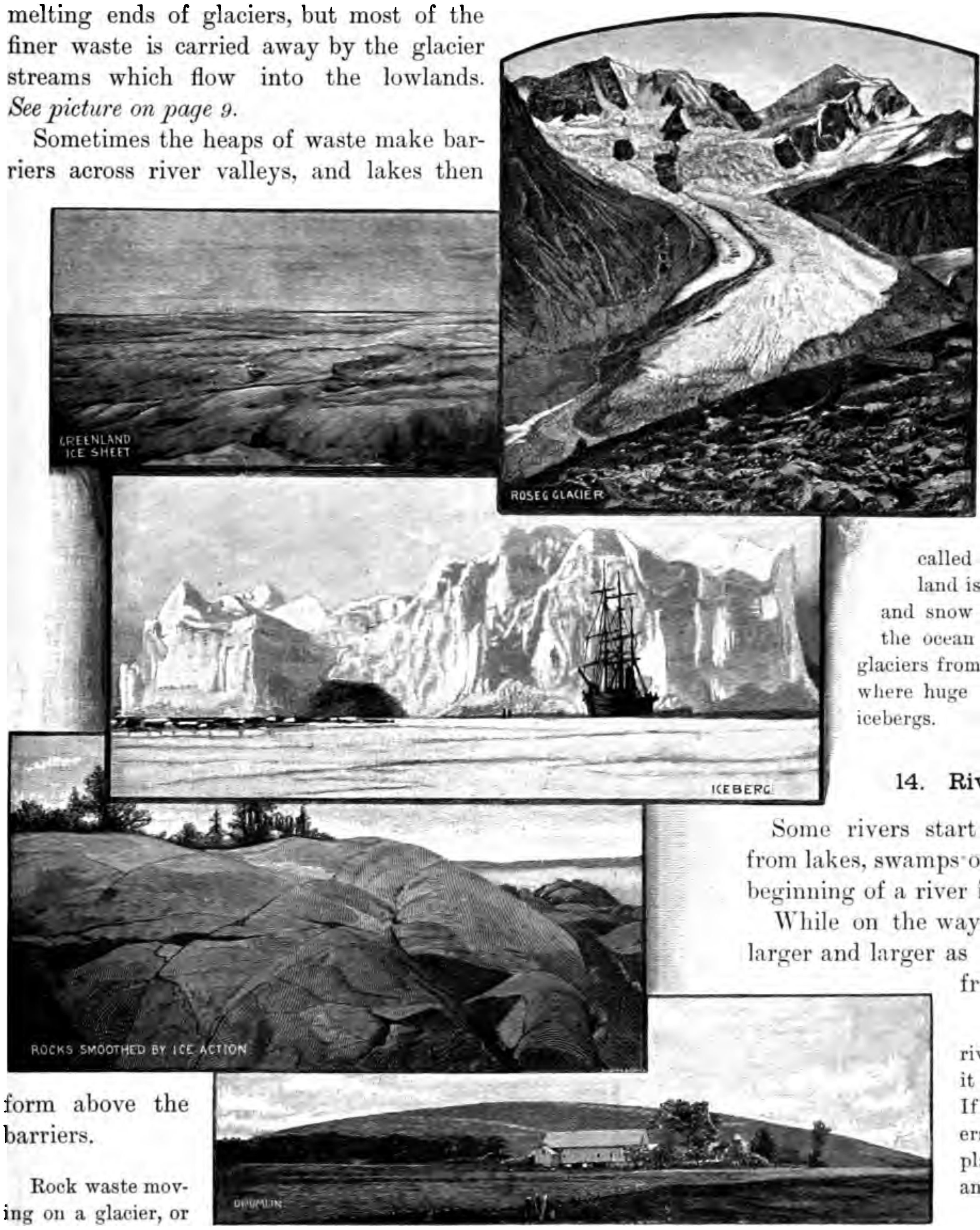
On some mountains, snow lies all the year and becomes very deep in the high valleys. Rain soaks into the snow, making it more compact. The heavy mass slowly changes into ice. As the layers of ice on a mountain grow thicker they creep down the slopes. When the ice enters the lower and warmer valleys, it gradually melts and forms brooks or rivers. Such a body of ice slowly moving down a slope is called a *glacier*.


Rock Waste at the End of a Glacier.

Glaciers carry along rock waste that rolls onto them from higher ground. They drag along stones, gravel, sand and clay also, beneath the ice,— scraping the surface over which they creep. The ice sometimes hollows out basins in the bottoms of valleys.

Coarse rock waste is left in uneven heaps near the melting ends of glaciers, but most of the finer waste is carried away by the glacier streams which flow into the lowlands. *See picture on page 9.*

Sometimes the heaps of waste make barriers across river valleys, and lakes then form above the barriers.



Rock waste moving on a glacier, or left in a heap at the end of a glacier, is called a *moraine*. The side or *lateral* moraines are formed of waste that is scraped from the sides of the glacier trough or that falls onto the border of the moving ice. When two branches of a glacier unite, the moraines along the sides which meet form a *medial* moraine. The picture of a glacier on this page shows both medial and lateral moraines.

The heap of waste at the end of a glacier is a *terminal* moraine.

In former times there were glaciers in some parts of the world, where none are now found. Lakes abound in such regions. The water lies in the basins scraped out by the ice, or behind the barriers which the rock waste formed across old river valleys.

One of the pictures on this page shows a rocky ledge, smoothed and rounded by the action of ice. Another picture shows a long low hill built of coarse rock waste that was left in this form by an ancient ice-sheet. Such a hill is called a *drumlin*. There are many old glacial lakes, smoothed rocks and drumlins in the northeast portion of our country.

When glaciers push their way into the ocean, huge blocks of ice break off and float away. These floating masses are called *icebergs*. They carry stones, gravel and fine rock waste into the sea.

When the icebergs melt, what becomes of this rock waste? *See picture on page 9.*

Icebergs chill the damp air around them and thus cause dense fogs. Many vessels have struck blocks of floating ice and have been sunk or partly wrecked.

Far away in the north is a land called Greenland. The interior of that land is covered with a thick sheet of ice and snow that moves very slowly towards the ocean on either side. Wide and deep glaciers from this ice-sheet creep into the sea, where huge blocks of ice break off and form icebergs.

## 14. Rivers and River Systems.

Some rivers start from springs. Others flow from lakes, swamps or melting ice and snow. The beginning of a river is called its *head* or *source*.

While on the way to the sea, a river becomes larger and larger as it is joined by other streams from side valleys.

Large cities are often built near rivers. If the water flows swiftly, it may be used to turn mill wheels. If the rivers are deep enough, steamers and other vessels may go from place to place, carrying passengers and freight.

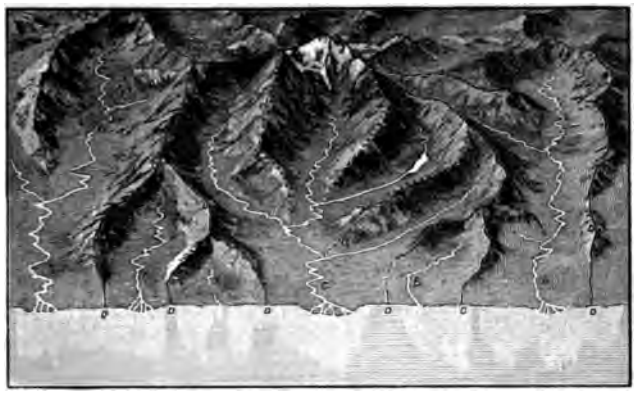
In dry countries where no branches join the rivers, they become smaller and smaller as they flow along, and they may even disappear before they reach the sea. The water often continues as *ground water* much farther than it can be traced in the surface streams.

Many wells in dry regions are fed by ground water thus supplied by vanishing streams. In some deserts, travelers can reach the ground water by scraping away the sand in the valley troughs. The water may be only a few feet beneath the surface.

During long periods of drouth, trees may be kept alive by the ground water which reaches their roots deep in the rock waste.

The lower end of a river, where it flows into the sea or into some other body of water is known as the *mouth* of the river.

Many of the largest cities in the world are built near the mouths of rivers. These cities carry on trade with one another, and collect and distribute merchandise for the people in the inland valleys.

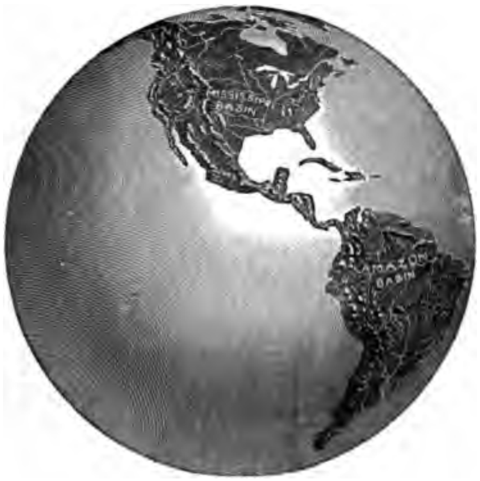


**River Systems and River Basins.**

A river and all its branches form a *river system*. The largest or the longest stream in a system is known as the *main* river.

How many river systems are shown in the above picture?

There are many river systems in each of the continents. Some of the main rivers flow three or four thousand miles from source to mouth. On the way they receive many branch streams called *tributaries.* Large rivers are sometimes tributaries of still larger rivers.



**America.**

The deep parts of rivers, where steamers and other crafts may go from place to place, are said to be *navigable.* Some rivers are navigable for many hundred miles from the sea.

## 15. River Basins and Divides.

All the land which sheds water into a single river system forms a *river basin*. The basin generally takes the same name as the main river in the system.

Find the line which bounds the basin of the river marked *C* in the picture at the top of this page. This line runs along the top, or *crest*, of the ridges, and separates the slopes in basin *C* from those in the other basins which adjoin it. Such a line is called a *divide* or a *water parting.* It divides the slopes of the basins.

A river system drains all the land which forms its basin. From the slopes of the basin, the streams carry the land waste towards their mouths. The longer the streams continue to flow, the lower the slopes of their basins are worn.

Some of the most important divides on the earth cross wide plains whose slopes are too gentle for the eye to detect.

The Amazon basin in South America is the largest in the world. Its main river pours into the ocean more water than any other stream. This basin is crossed by the equator and covers more than two million square miles. Steamers can go for thousands of miles up and down the many branches of the Amazon system.

The Mississippi basin is the largest in North America, but is only about one half as large as the Amazon basin. The map on this page shows where these great basins are.

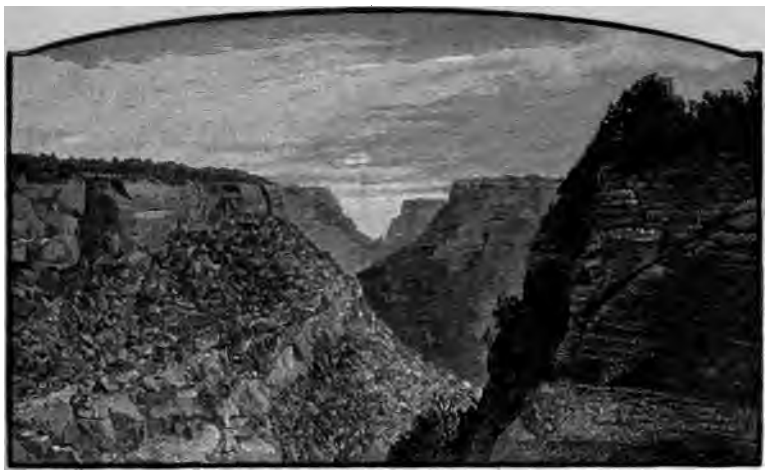
**Flooded Connecticut River.**

## 16. Young and Old Lands.

A swift river rolls stones and sand along in its bed and thus wears it deeper and deeper. After long ages the bed in which the river flows may be worn down almost to the level of the sea. Then the slope of the stream will be gentle. Its current will be slow and its wearing power very slight.

Most large rivers flow slowly, because they have already worn their beds down to gentle slopes. The slow current favors the use of boats on rivers.

While a stream is deepening its bed, the rock waste all over its basin is weathering finer and finer. This waste is always creeping and washing into



Narrow Valleys in a Young Land (Colorado).

the valley bottom or into streams that carry it away. Thus the valley grows wider and its side slopes become more gradual. The uplands or hills on either side become smaller and lower, as they slowly waste away.

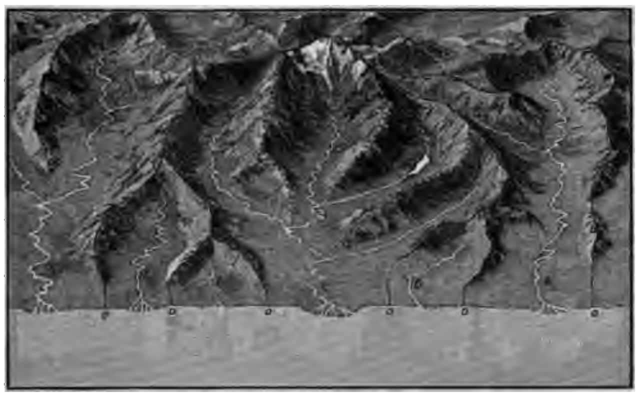
In a very long time, even a highland may be worn away to a lowland. Thousands of years are needed for this great work, but the earth is very old, and highland after highland has been worn down.

Lands whose valleys are not yet widened may be called *young*, even though their streams have been working for thousands of years.

The picture at the top of this page shows a young land in which rivers have cut only narrow valleys. The uplands between the valleys are almost level and the rock waste creeps slowly down the gentle slopes and then falls into the valleys.

Many small streams are gnawing into the upland and after a time it will not be so smooth as it now is. We may know that this is a young land, because the streams have not yet carried much of it away.

Lands whose valleys are greatly widened, and whose hills or mountains are almost worn away, may be called *old*.



Mountainous Region.

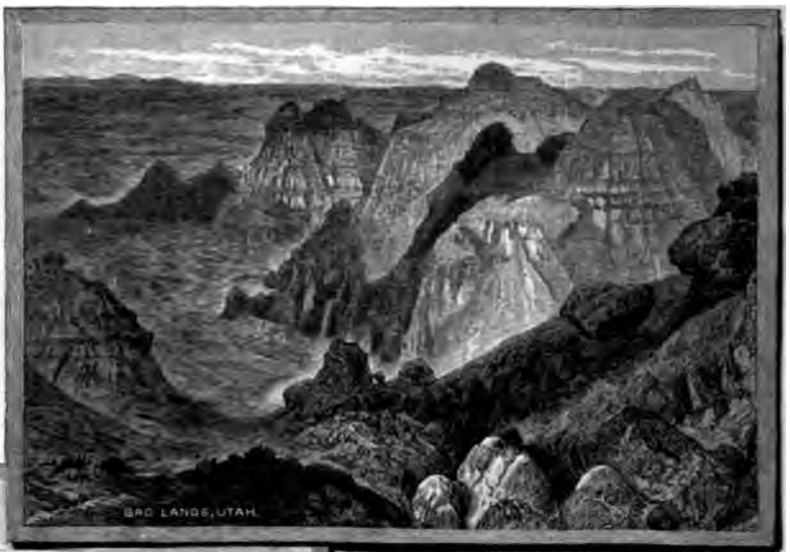
**In the middle-aged country, the uplands are deeply and widely cut by valleys. The rain water runs quickly from the uplands and carries away much land waste. In the old land, most of the upland is worn down and only a few hills remain. In time, even the hills will waste away. Then the streams will become sluggish, but they may be useful as water ways.**

**We cannot watch a land grow to old age, for the change is very slow, lasting many hundred thousand years.**

### 17. Flood Plains and Deltas.

After heavy rains, or after much snow has quickly melted, great volumes of water run down the brooks and into the rivers. Then the rivers often overflow their banks and spread over the flat meadows, called ***flood plains***, on either side.

Flooded rivers are very muddy, for they not only cut their own banks, but their swollen branches also bring them a great deal of land waste from the sides of their valleys. The water moves slowly on the flood plains and deposits thin layers of mud, called *silt*. When the flood is over, this silt gives fresh food to plants.



Middle-Aged Land.

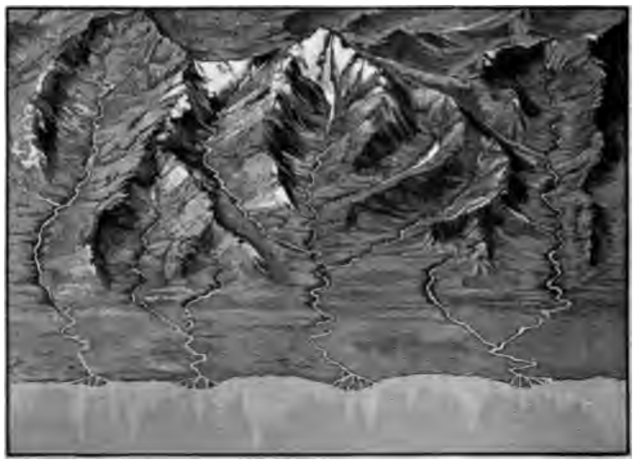
TABLE MOUNTAIN.

Old Land.

In narrow valleys the flood plains extend for only a short distance on either side of the river. In broad valleys the flood plains may be several miles wide.

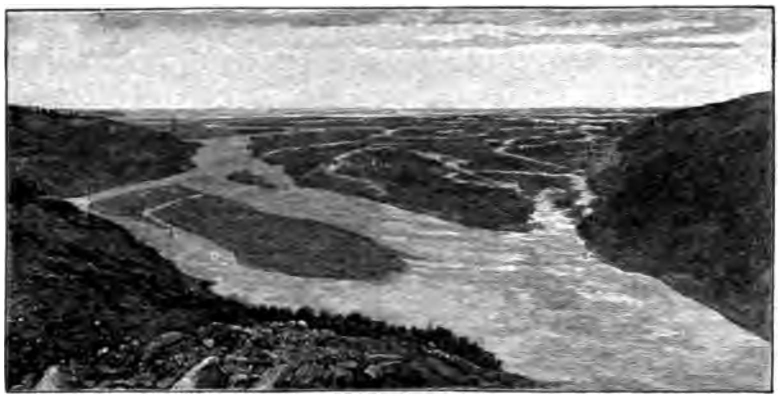
Many people live on flood plains because they are so fertile. In dry countries, flood plains are the best places for people to settle, because the river water can be led in canals and ditches across such plains.

Most of the silt borne along by rivers is slowly washed down the



Mountainous Region and Coastal Plain.

channels to the sea. A large part of the silt settles near the river mouths, where the water flows more slowly.



**Delta in Alaska.**

The settlings, called *sediment*, form low and flat plains in which the rivers often divide into many branches, called *distributaries*. The distributaries sometimes change their course, cutting new channels across the plain.

Lowlands thus formed at the mouths of rivers are known as *deltas*. Most deltas are the lower ends of flood plains built out into the sea. The soil of delta plains is generally fine and fertile.

In the far east, about halfway round the earth from us, there is a large delta plain on which millions of Chinese people live. Most of this delta was made by the Yellow river.

This river sometimes takes a new course across its delta plain. Fields, villages and cities are then flooded or swept away, and many people are drowned.

The Mississippi river, in our own country, has made a flood plain several miles wide and hundreds of miles long. Its lower part is a very large delta plain. These lowlands built by the great river are very fertile.

## 18.

## Coastal Plains and Lake Plains.

Many parts of the land were formerly under the shallow water of the ocean border. Ages ago they were slowly raised from beneath the sea and became dry land. The sea-bottom near the shores of the continents is slowly made smooth by layers of silt washed from the land. When evenly uplifted, the smooth bottom forms plains having very gentle slopes. Fossil sea-shells are often found in the rocky layers of such land.

**City on a Narrow Flood Plain. (Ems, Prussia.)**

COASTAL PLAIN, N.J

LAKE PLAIN, ADIRONDACKS.

OLD LAKE SHORE, MICHIGAN.

DAKOTA LAKE PLAIN

A plain that was once part of the sea-bottom and that is now near the coast is called a *coastal plain*.

Before the coastal plain shown in the picture on the opposite page was raised from the sea, the shore was nearer the high land. The mouths of the rivers were then at the old shore line. The rivers now flow across the young coastal plain.

The rivers *A* and *B* were at one time in separate systems but are now joined into one.

Every continent has coastal plains at some parts of its border. These plains vary in width from a few miles to hundreds of miles. The surfaces of coastal plains quickly weather into fine soil and often make good farming lands. The map on the next page shows a large coastal plain in our own country. Near the coast the plain is still

Mountains (Jungfrau, Alps).

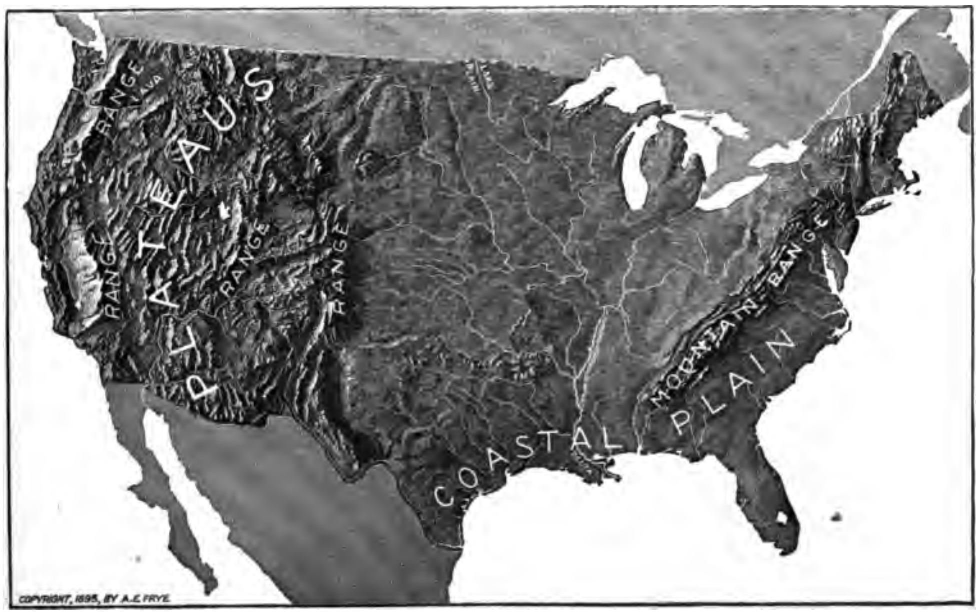
smooth, but farther inland it is already much worn by streams. Pine forests cover parts of the plain, while cotton and tobacco grow in the more fertile districts.

Some plains were formed under lakes and were laid bare when the water was drained away.

One of the pictures on page 13 shows a great *lake plain*, with broad harvest fields. This plain is so young that hardly any valleys are worn below its level surface. Find the lake plain on the map below.

Many lake plains are found in valleys among mountains. These plains are small, but in regions where the steep slopes have only a thin and stony soil left on them, the meadows in the old lake bottoms are of great value for farming.

Plains that stand high above sea level are called *plateaus*. Most of the rocky layers in plateaus were made very long ago beneath the sea.



The United States.

Some plateaus are so old that broad valleys have been worn in them, thus making many small plateaus out of each large one. The map on this page shows a high and wide plateau region in our own country.

Low plains can have only shallow valleys, but plateaus are often broken by deep valleys, making travel very difficult.

## 19. Mountains.

Mountains are rugged parts of the earth's surface that rise high above the surrounding country. They are generally formed by the wearing of deep valleys in regions that have been greatly uplifted. The mountains are the high parts not yet worn away.

While the great masses are being lifted, their rocks sometimes fold or break underground. Every snap or slip in the rocks causes the surrounding region to tremble. The trembling is called an *earthquake*.

Some earthquakes are very faint, but others are violent enough to throw down houses. The next lesson tells another cause of earthquakes.

Valleys cut in a Plateau.

Some mountain regions are worn away to sharp rocky peaks. The mountains of other regions are rounded like domes. Still others have flat tops and steep sides.

A high and rugged ridge, or several such ridges near one another, may be called a *mountain range*. Some ranges are hundreds of miles long.

Find five ranges on the map. Which of these ranges lie along the border of the great plateau region in our country.

A number of ranges having the same general direction in one great highland form a *mountain system*.

All the ranges in the western part of our country belong in the *Rocky Mountain system*. This mountain region was very unevenly lifted and is now so greatly worn away that its surface has gone down to beds of rock that were once deeply buried. It is in such deep layers of rock that veins yielding gold and silver ore are found. When the surface is worn down near them they can be mined.

High mountains reach into the upper air which is cold, even when the air in low valleys not many miles away is very warm. On the lofty peaks, three miles or more above sea level, the air is so light or thin that persons find it difficult to breathe there. The lower air, near the level of the sea, is dense because it is pressed down by all the air above or upon it.

Winds are active around high mountains, and clouds form quickly in the cooled air as it rises to cross the ranges. When the air is cooled enough, it gives out snow or rain. Snow often falls on the mountains, while rain is falling in the lower valleys.

Great snowslides or landslides sometimes rush from the mountain sides into the valleys, uprooting trees and burying houses. A slide of snow or of rock waste is called an *avalanche.*

Some plateaus, deeply cut by streams, are called *mountains*, but many mountains are higher than plateaus and are not so evenly raised above the sea.

### 20. Volcanoes.

In some parts of the world, melted rock, or *lava*, has been pushed up from beneath the surface through breaks in the surface rocks, and has cooled in great cone-shaped heaps or in broad sheets. In some places this work is still going on.

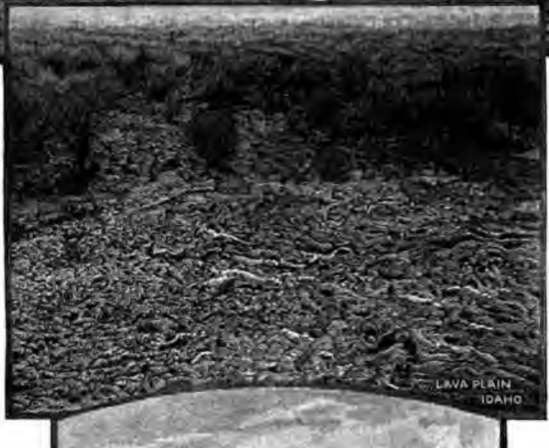
Steam and gases sometimes burst forth with the lava, shaking the surrounding country and thus causing severe earthquakes. The lava is then blown into fragments called *ashes*, or even into fine dust that may be carried many miles by the wind. Cones built of lava and ashes have steep sides, with hollows or *craters* in the top, where the gases and ashes were blown out. Lava often escapes through cracks, or *fissures*, in the sides of cones as well as from the craters.

When the lava is pushed out quietly, it does not form such steep-sided cones. The molten rock then runs in long streams or sheets, and sometimes covers many square miles of country. The more liquid-like the lava, the farther it flows and the gentler the slopes of the cone become.

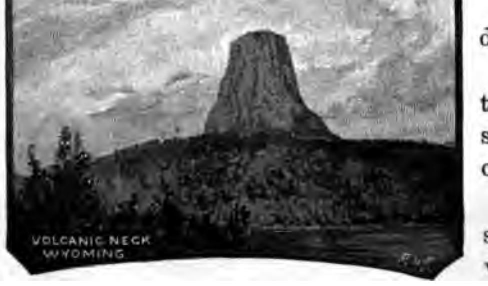
YOUNG ASH CONE

VESUVIUS

LAVA FLOW 1880-1



LAVA PLAIN IDAHO



VOLCANIC NECK WYOMING

Each of these cone-shaped masses is called a *volcano.* It may be no larger than a hill, or it may be two or three miles in height.

The bursting forth of lava from a volcano or a fissure is called an *eruption.* Many eruptions must take place to build up a great volcanic cone.

The molten rock from volcanoes sometimes spreads out in wide plains. In some places, lava has poured from long fissures in the earth's surface and has formed plains that cover many thousand square miles.

The picture marked "Lava Plain, Idaho," shows part of a great lava plain in our country. The lava has weathered slightly and its scanty soil now supports sagebrush.

The plateau shown in the picture on the opposite page is built of many thick lava sheets.[1] It is older than the lava plain shown on this page, for the surface of the former is more deeply cut by valleys.

The lowest picture in the group shows a stump, or *neck*, of lava which may have supplied an ancient volcano. This neck filled the passage in the rocks through which the molten lava rose from its deep source. At that time the surface of the country was much higher than at present. It has since worn away, and the hard lava of the neck remains standing above it.

Deep fissures filled with hard lava have been laid bare, when the softer rock about them has been worn away. These old lava-filled fissures sometimes rise like long rocky walls, and are known as *dykes.* There are many lava necks and dykes in the western part of our country.

Most volcanoes are found not many miles from the coasts of the continents, or on islands not far offshore. Many more volcanoes are found near the Pacific coast than near the Atlantic.

Besides these, a large number of small islands have been wholly built by volcanic action, sometimes even growing from the deep floor of mid-ocean.

Some eruptions have also taken place on the continents several hundred miles from the seacoast, as in the Rocky mountains of our country, but such eruptions are rare.

As we study the different countries, we shall learn more about volcanoes, some of which have destroyed cities and towns.

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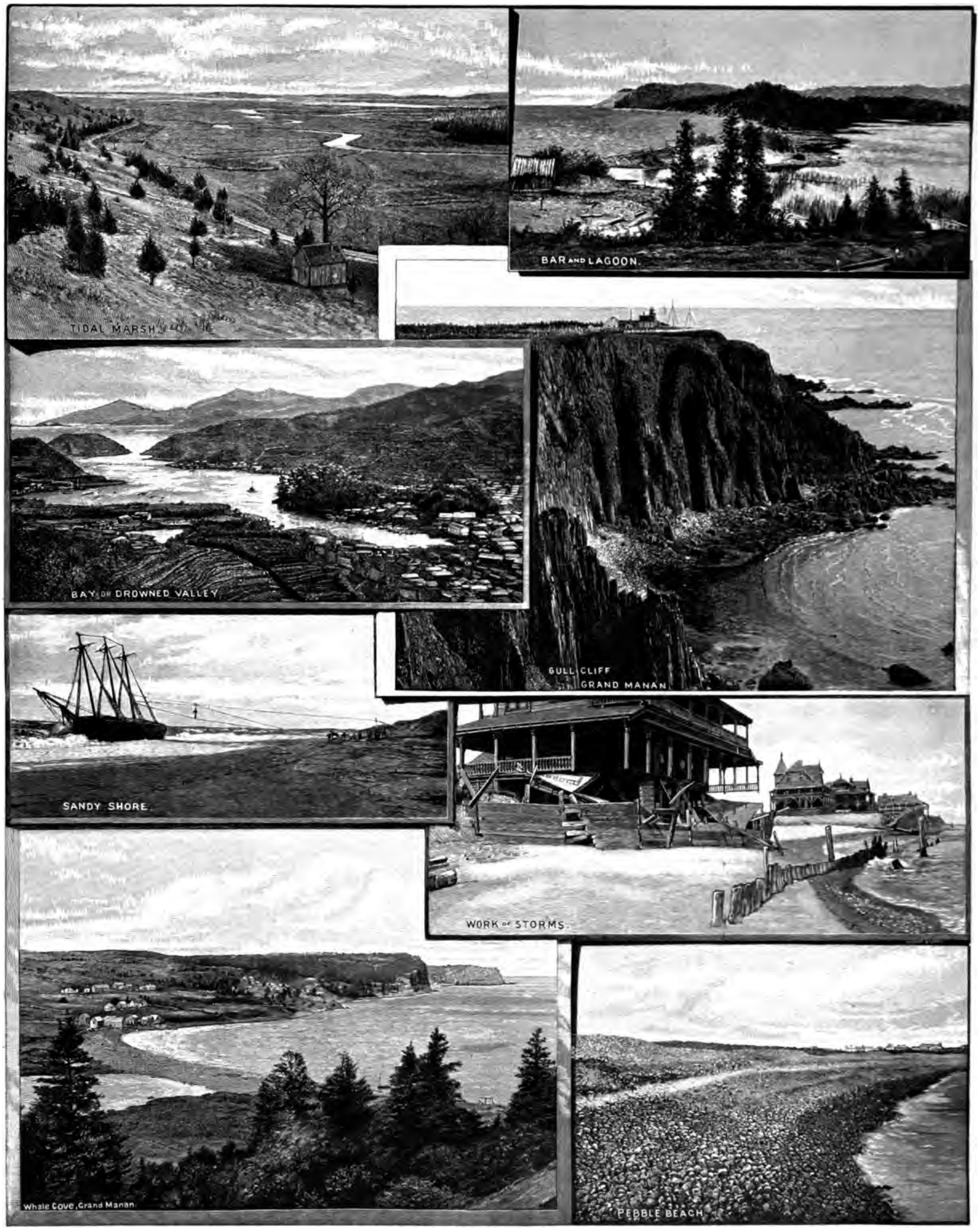
[1] This plateau is in the Western Ghats, India, and is part of the Deccan lava flow. In that region, the lava has spread over an area of about 200,000 square miles.


TIDAL MARSH.
BAR AND LAGOON.
BAY OF DROWNED VALLEY.
GULL CLIFF
GRAND MANAN.
SANDY SHORE.
WORK OF STORMS.
Whale Cove, Grand Manan.
PEBBLE BEACH.

## 21. Waves.

Winds blowing over the sea make waves. Under strong winds the waves are sometimes thirty or forty feet high, from trough to crest.

**Breakers or Surf.**

If a hanging rope is struck or shaken, waves glide along it. The rope simply bends to form the waves.

The water in waves only rises and falls, like the waves in the rope, but the *wave-forms* travel forward. The larger they are, the faster they move. In the open sea some waves travel at the rate of more than a mile a minute.

Storms at sea are dangerous chiefly on account of the waves. They pitch vessels about and sometimes wreck them.

The great waves produced in a storm may spread far across the ocean. They lose height as they go, and are then called *swell.*

When the swell approaches shallow water near shores, it increases in height again and rolls forward in the form of *breakers* or *surf* on beaches.

Waves on beaches often wash pebbles and sand up and down, grinding them finer and finer. Great storm-waves are strong enough to move large blocks of rock.

When severe earthquakes occur near coasts or at the bottom of the sea, they produce broad waves, called *earthquake waves,* that travel with great speed. Such waves rolling upon shallow shores become very high and strong. Vessels in harbors are sometimes dragged from their moorings and carried by earthquake waves far up the shores.

## 22. Shore Forms.

Straight or regular shores are found where smooth bottoms have been slowly raised from the sea.

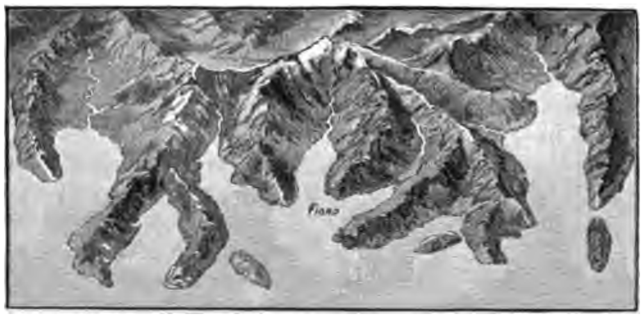
Along such shores there are but few bays in which vessels can find shelter from winds and waves. People living near regular shores are seldom good sailors.

Irregular shores occur where hilly or mountainous lands have partly sunk beneath the sea.

Valleys that have sunk beneath the sea are said to be *drowned.* The *drowned valleys* form *bays.* Deep, long and narrow bays are known as *fiords.* The ridges, hills, or other parts of the land between the drowned valleys, may form islands or peninsulas.

The picture at the bottom of this page shows several fiords formed by the partial drowning of the mountainous region shown in a picture on page 12. Some fiords are many miles long and are very deep.

There are many fiords along the northwest coasts of North America and Europe.



**Fiords or Drowned Valleys.**

The word *peninsula* means *almost an island.* Peninsulas are only partly surrounded by water. A *neck* of land joining a peninsula with another body of land is called an *isthmus.*

A *strait* is a body of water joining two larger bodies of water. A strait may be many miles in width, but it is always narrower than the bodies of water which it connects. The word *strait* means *narrow.*

Some long and shallow straits are called *sounds.* The name *sound* may also be given to any body of water partly inclosed by islands. Sounds and straits are often only drowned valleys. Some of them are very deep.

Large arms of the sea are called *bays, gulfs* or *seas.* Some of these are hundreds of miles long and wide.

Bodies of water that afford shelter to vessels are known as *harbors.* Many fine harbors are found in the mouths of rivers or in drowned valleys.

Along irregular coasts vessels find shelter in bays or behind islands. Men living near such coasts generally become good sailors.

**A Fiord, Norway.**

Storm-waves slowly wear away parts of some coasts. The waves beat most violently on headlands that jut far out into the sea. As these are worn back, their steep faces form *sea-cliffs.*

Low and sandy shores may be so rapidly worn that houses are undermined and washed away.

In cold regions floating ice helps to change the shore lines. Tons of sand, pebbles and large rocks become imbedded in the ice and are thus borne out to sea. Ice is also driven by waves against the shores, where it helps to grind even the rocky cliffs.

Rock waste from headlands often forms beaches at the foot of the cliffs. Part of the waste is also carried by waves along the shores, where it is spread out into *beaches* or built into *bars,* cutting off parts of bays. In this way the shores become straighter.

Waves often gather sand from shallow bottoms and throw it up in bars off low shores, thus partly inclosing bodies of water, called *lagoons.*

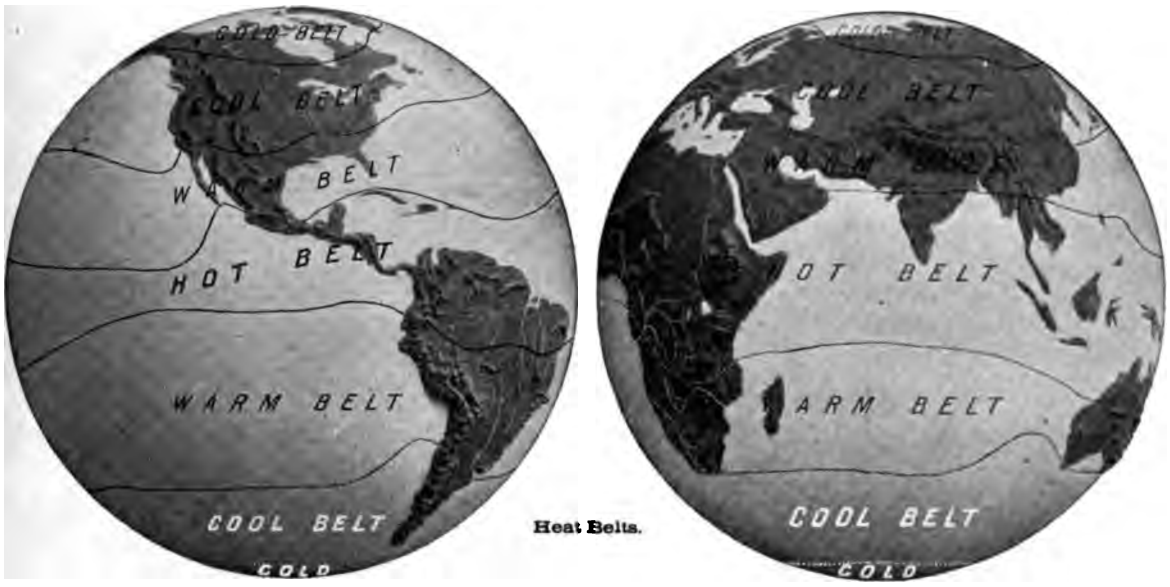
Fine waste from the land settles in the quiet lagoons, and water-plants then grow there. In time the lagoons may thus be filled, forming *marshes.* There are many thousand acres of marsh land formed in this way along the eastern coast of our country.

Sometimes the beaches and bars are made of cobblestones or of pebbles worn round and smooth, by being rolled against one another. Many beaches and bars are made of sand. More than one half the shores of the United States are low and sandy.

### 23. Belts of Heat.

The sun is a hot globe more than a million times as large as the earth. This great globe is very far away, yet it keeps the earth warm enough to support life.

If, when Columbus set sail on his first voyage to America, some object could have left the sun and traveled at the rate of twenty-five miles an hour towards the earth, that object would still be several million miles away from the earth. The average distance of the earth from the sun is about 93,000,000 miles.



**Heat Belts.**

The sun's rays shine through clear air without warming it very much, but they warm the clouds and the dust in the air, and also the surface of the land and the sea. All these help to warm the air about them, but the land and the seas warm the air much more than the clouds and the dust do.

Figure 1 shows how the sun shines on different parts of the earth. Over the line *B* all the rays are nearly vertical. Over the line *A* the rays strike the earth with greater slant. As many rays shine on *B* as on *A*, but the slanting rays spread over the greater surface, and therefore cannot heat it so much. The more nearly vertical the rays are, the greater their heating power.

Near the equator the sun's rays are vertical, or nearly so, at noon every day. There the air is hot all the year, except high above sea level. That region of hot air is called the *hot belt.*

Around the poles the rays are very slanting, and the air is always cold or cool. The polar regions are known as the *cold belts.*

Between the *hot belt* and the *cold belts*, there are other belts neither so hot nor so cold. On either side of the hot belt lies a belt of land and sea on which the sun's rays fall with but little slant. We will call these two belts the *warm belts.*

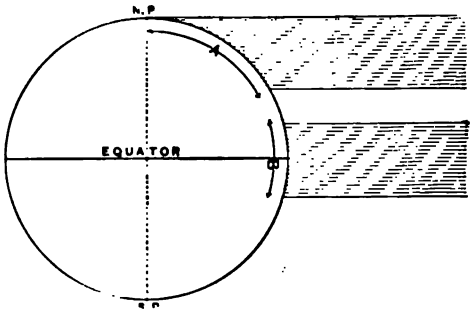


**Figure 1.**

Between the warm belt and the cold belt, on each side of the equator, lies another belt on which the rays fall with a great deal of slant. These two belts are the *cool belts.*

In later lessons we shall learn why the lines between the belts are somewhat irregular.

Between the heat belts, there are no sudden changes from hot to warm, from warm to cool, or from cool to cold. All the way from the belt of greatest heat to the places of greatest cold, there is only a very gradual change.

There is very little land in the cool and cold belts south of the equator. Name in order the heat belts which would be crossed in going from pole to pole.

### 24. Changes of Season.

Once a year the earth moves, or *revolves*, in an almost circular path round the sun. This path is called the earth's *orbit.*[1]

The earth is one of many bodies, called planets, that revolve round the sun. The diagram on the opposite page shows which part of the orbit the earth moves through each month. The arrows indicate the direction in which the earth moves.

The earth's axis does not stand upright from the plane of its orbit, but slants so that the strongest sunshine falls north of the equator during about one half of the year, and south of the equator during the other half.

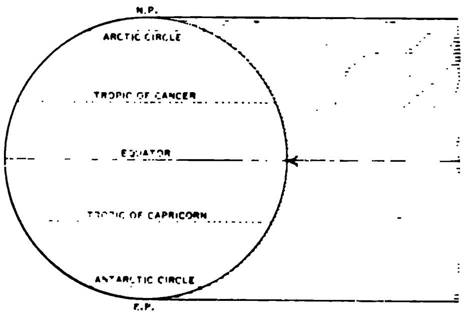


**Figure 2.**

All the year the axis of the earth *points towards the north star* and is therefore called a *fixed axis.*[2] Every moment the earth changes its own position with regard to the sun, but the direction of the axis remains the same. The northern end of the axis leans towards the sun in June, when the sunshine is strongest north of the equator; and away from the sun in December, when the sunshine is strongest south of the equator.[1] As the earth moves round its orbit, the sun's rays are strongest north of the equator during our spring and summer, but south of the equator during our autumn and winter.

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[1] The orbit is an ellipse, with the sun near the center.

[2] Although the earth's axis makes no perceptible change from year to year, yet in long ages a great change takes place. In about 12,500 years the bright star *Vega*, in the constellation of *Lyra*, will be the north star. In about double that length of time, the axis will again point towards the present north star.

Even now the north star is not *exactly* in line with the earth's axis.

Half the year, the vertical rays fall north of the equator, but they fall farthest north on the twenty-first day of June. At that time the northern summer and the southern winter begin. *See figure 3.*

During the other half of the year the vertical rays shine south of the equator, but they shine farthest south on the twenty-first day of December, — at about Christmas time. Then the northern winter and the southern summer begin. *See figure 4.*

Our spring opens on the twenty-first day of March, when the vertical rays fall on the equator, and the days and nights are everywhere of equal length. The earth is then moving in that part of its orbit which brings the vertical rays farther and farther north of the equator and makes our days longer than the nights. The spring is the *warming season* between winter and summer. *See figure 2.*

The first day of our autumn brings the earth to that part of its orbit where the sun again shines over the equator, but the vertical rays are each day moving southward, making our nights longer than our days. The northern autumn, or the *cooling season* between summer and winter, begins on the twenty-second day of September. *See figure 2.*[2]

## 25. The Zones of Light.

The line around the earth, upon which the vertical rays fall when farthest north, is called the *tropic of Cancer.*

The line upon which the vertical rays fall when farthest south is called the *tropic of Capricorn.*[3]

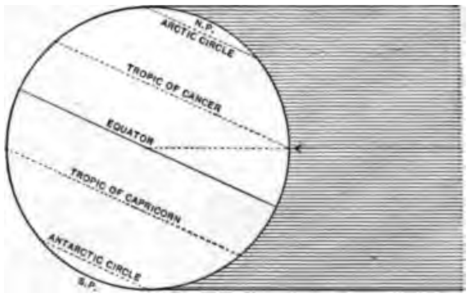

**Figure 3.**

The tropics are at about one fourth the distance from the equator to the poles. The belt of land and water lying between or within the tropics is called the *torrid*[4] *zone.* It includes the greater part of the hot belt.

When the sun is over the equator, the line between daylight and darkness passes through both poles. *See figure 2.*

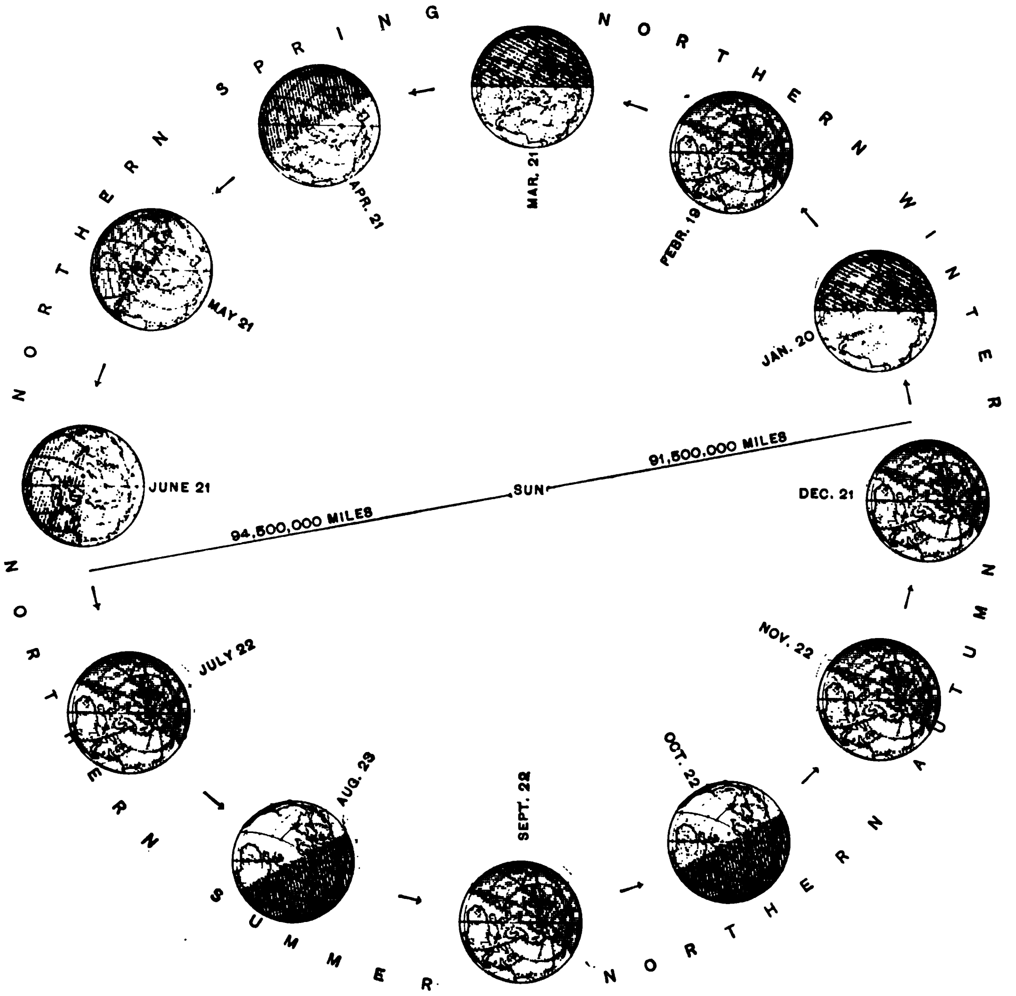

**Diagram showing the Position of the Earth in its Orbit each Month.**

When the sun is over the tropic of Cancer, the light extends far beyond the north pole, but does not reach the south pole, because only one half the earth is lighted at once. *See figure 3.*

When the sun is over the tropic of Capricorn, a region all around the south pole is in the light, but the north polar region is in darkness. *See figure 4.*

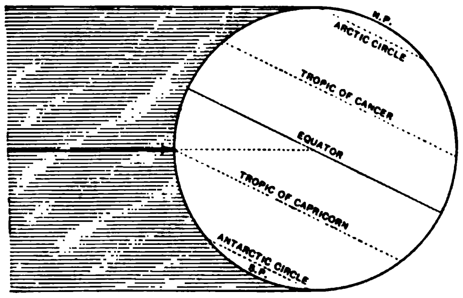

**Figure 4.**

These figures show that at all times the lines between light and darkness are just as far from the poles as the sun is north or south of the equator. When the sun is over either tropic, the lines between light and darkness must therefore be at about one fourth of the distance from the poles to the equator.

When the sun is over the equator, every place from pole to pole has twelve hours of day and twelve hours of night. As the earth moves along that part of its orbit which brings the vertical rays farther and farther north of the equator, the days in the northern hemisphere become longer and the nights shorter. The farther north a place is, the longer its daylight then lasts.

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[1] Owing to the fact that the sun is not in the center of the earth's orbit, and that the earth does not move at the same rate of speed in all parts of its orbit, the vertical rays fall north of the equator for about 185 days, and south of the equator for about 180 days.

[2] For some purposes, the seasons are divided at the beginning of March, June, September and December. Thus, the average temperature of summer is based on the temperature of the entire months of June, July and August.

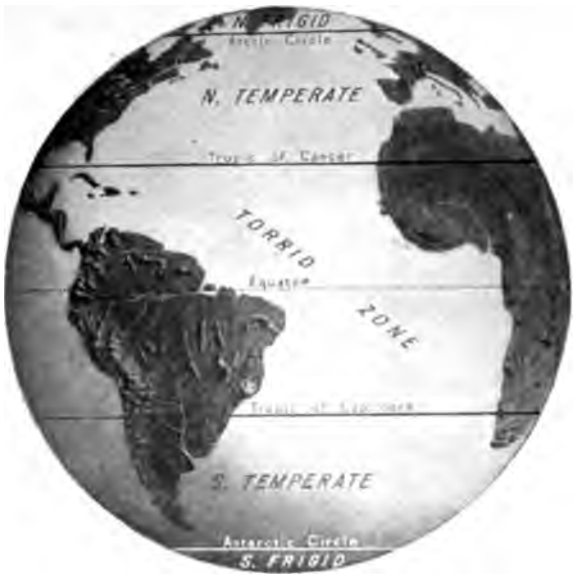
[3] The word *tropic* means the *turning* place, and applies to the line over which the sun *seems* to turn backward on its journey. Cancer, the *Crab,* and Capricornus, the *Goat,* are names of groups of stars through which the sun once seemed to pass when over the tropics.

[4] Torrid means *parched;* frigid, *cold;* temperate, *moderate.*

As the sun shines farther north of the equator, there is a growing cap around the north pole, within which there is no darkness. When the sun is farthest north, the cap of constant daylight is bounded by the *Arctic circle*.

As the earth moves in that part of its orbit which carries the vertical rays away from the tropic of Cancer, the cap of constant daylight in the far north grows smaller, and it finally disappears when the sun crosses the equator.

As the sun moves south of the equator, a cap of constant *darkness* grows around the north pole, while a cap of constant *daylight* around the south pole grows till it reaches the *Antarctic circle*. The Arctic and the Antarctic circles are known as the *polar circles*.



Map of the Zones

Which of these lines bounds the *north frigid zone*? Which bounds the *south frigid zone*? The frigid zones include almost all parts of the cold belts or cold caps.

What circles bound the *temperate zones*? These zones include most parts of the cool belts and the warm belts.

Ferns growing on Trees, India.

Thus we see that at the north pole, daylight lasts for six months, or while the sun is north of the equator. During that time the south pole is in darkness. While the sun is south of the equator the south pole is in constant daylight, and the north pole is in darkness.

At the polar circles the longest period of light or of darkness is twenty-four hours. The Arctic circle has its longest daylight when the sun is over the tropic of Cancer. When do places on the Antarctic circle have their longest period of light?

Between the Arctic circle and the north pole the longest periods of daylight vary from twenty-four hours to six months. Each place within this circle has continuous light for a day, or for some greater length of time not more than six months. Each place has only one of these long days yearly, but it has also many days, or periods of light, less than twenty-four hours long. The nearer the pole, the longer the great period of daylight lasts.

The south frigid zone has the same number of light and of dark periods as the north frigid zone. The *longest* period of daylight in any place within either of the polar circles lasts during the *longest* period of darkness in some place just as far within the other polar circle.

## 26. Seasons of the Heat Belts.

The open oceans and the air over them do not warm much in summer nor cool much in winter. The greatest changes in heat take place over wide lands. These heat very quickly in the strong sunshine of the long summer days, and they cool very quickly in the long winter nights. The larger the land area, the more extreme its seasons are.

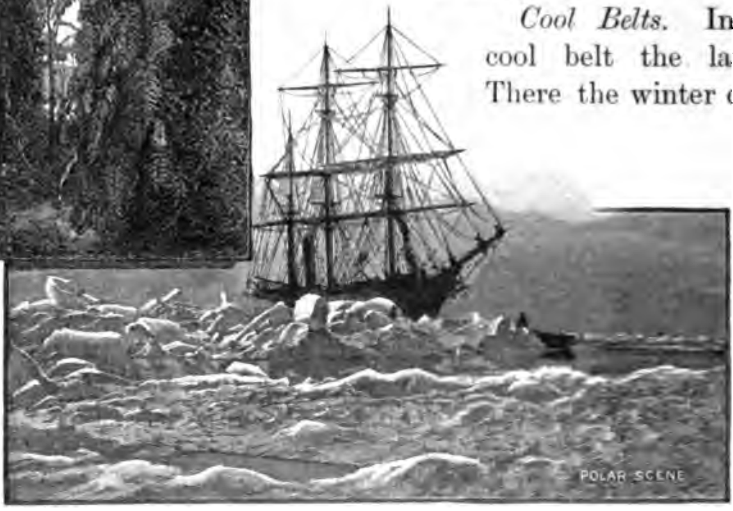
*Cold Belts.* The seasons in the cold belts are a long and extremely cold winter, and a short cool summer.

During the long winter nights, how cold the air of these belts must become! Ice and snow cover the land and almost all parts of the polar seas. Only a few places in the Arctic ocean are kept open by water drifting from the warmer parts of the Atlantic.

Even during the long daylight of summer, the air of the cold belts cannot become very warm, because snow and ice cover most of the land and sea near the poles and a large part of the sunshine is taken to melt a portion of this snow and ice. The few people living within the northern cold belt are found mostly near the shores past which the warmer waters drift from the south. These people get their food mainly by hunting and fishing, or by tending herds of reindeer. No people live in the southern cold belt.

Brilliant lights, called the *aurora*,[1] sometimes appear in the polar skies, and are also seen from places far beyond the frigid zones. The auroras diminish the darkness of the long polar night.

*Cool Belts.* In the northern cool belt the lands are wide. There the winter days are short, and the sunshine of that season is slanting and weak. The winters are therefore very cold, especially in the



Caught in an Ice Floe in Baffin Bay.

Eskimo Boy.

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[1] The northern lights are called the *aurora borealis*. The southern lights are called the *aurora australis*.

northern half of the belt, where snow covers the ground for several months each year, and where heavy frosts are common in the late spring and the early autumn.

In spring and summer the days of this cool belt are long and the sun's rays are not very slanting, except in the northern part of the belt. The summers thus become very warm, especially in the southern half of the belt.

In the cool belt of the south there is not much land. and the climate therefore changes but little. The air over the oceans remains steadily cool, while over the narrow lands it varies only from warm to cool.

*Warm Belts.* The lands in the northern warm belt are wide, but the days and nights do not differ greatly in length, and the sun's rays are never very slanting. The winters on the lands are cool but not cold. The summers are very hot. On the northern oceans, both in the cool and the warm belts, the change of seasons is much less than on the lands.

The winters and the summers of the lands in the southern warm belt are well marked, but these lands are small compared with the oceans in the same belt. The change of seasons is greatest on the small land interiors, and least near the coasts and on the oceans.

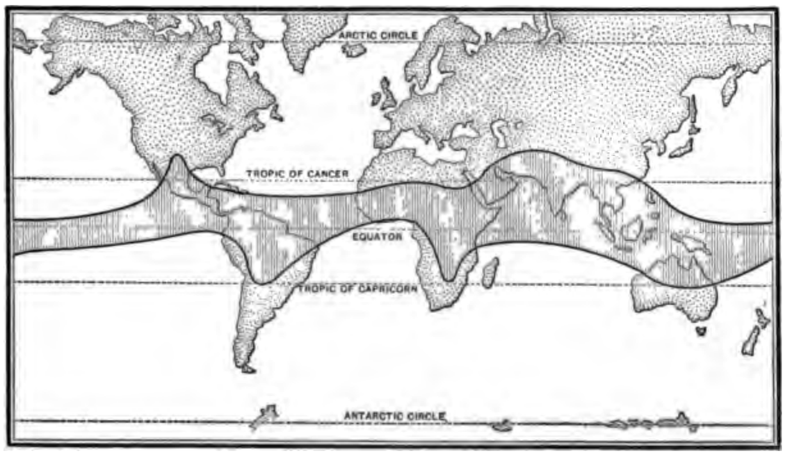
*Hot Belt.* In the hot belt the slant of the sunshine varies but little, and the days and nights are always about twelve hours long. There the change of seasons is very slight, and there is no winter. The air is hot nearly all the year.

The line of greatest heat around the earth is called the *heat equator.* It shifts north and south once a year, always towards the places where the sunshine is strongest. The line of greatest heat therefore follows the movement of the sun.

The positions of the heat equator in our winter and our summer are shown on this little map. The southern edge of the shaded belt is the heat equator for January. The northern edge is the heat equator for July. Let us not forget that our winter months are the summer months in places south of the hot belt.

During the time between January and July, — the first half of the year, — the heat equator shifts slowly northward, through the entire width of the shaded belt on the map. During the latter half of the year, the heat equator moves slowly southward across the same belt.

The heat equator moves farther from the true equator on the lands than on the sea, because the land warms much more quickly than the water.

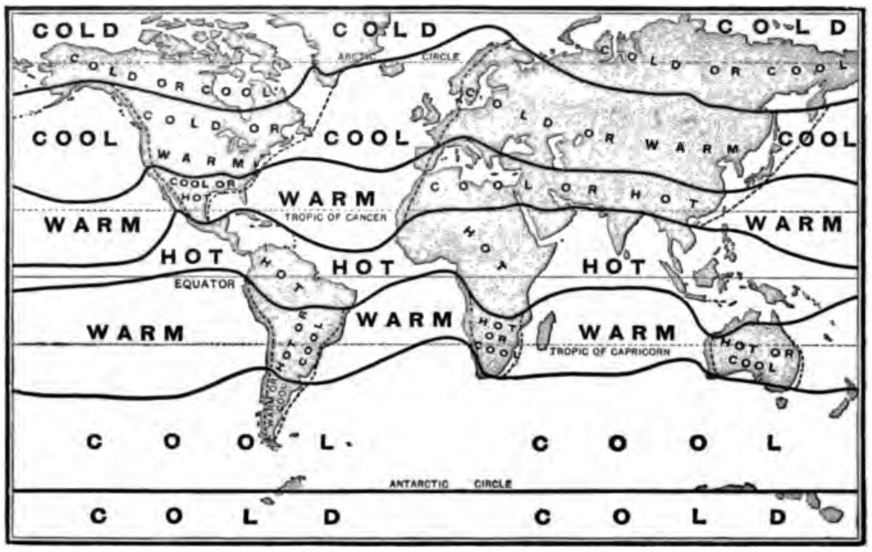


Range of the Heat Equator.

Northern Lights.

As the heat equator shifts north and south, the weather of all the heat belts shifts with it, back and forth once a year, following the sun.

During our summer, hot weather spreads into the northern warm belt; the warm weather shifts into the cool belt; the cool weather shifts into the cold belt; the cold weather dwindles away and perhaps disappears from the north polar region.



Heat Belts and their Seasons.[1]

During our winter, the cold weather of the northern cold belt spreads far southward over the cool belt; the cool weather shifts to the warm belt; and warm weather only is felt at the border of the hot belt.

South of the equator, the opposite changes are meanwhile taking place. When the warmer weather swings northward from the equator, the cooler weather shifts towards that line from regions south of it; but owing to the smallness of the southern lands and the vastness of the oceans, the seasons south of the equator do not present great extremes of heat or cold.

In all the heat belts, the highlands are cooler than the lowlands. Even near the equator, the tops of very high mountains are covered with snow all the year.

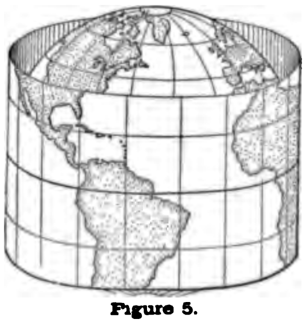


Figure 5.

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[1] Figure 5 shows the plan on which the above map of the *Heat Belts* is made. It is as if the places on the globe were lifted outward, away from the center of the globe, and drawn upon the paper cylinder, which is then cut apart and spread out as in the above map. In such a map, the cold and the cool belts appear much too large, for the polar circles are stretched to the full length of the equator.

## 27. Latitude and Longitude.

Every circle, both large and small, may be divided into 360 parts, each of which is called a *degree*.[1]

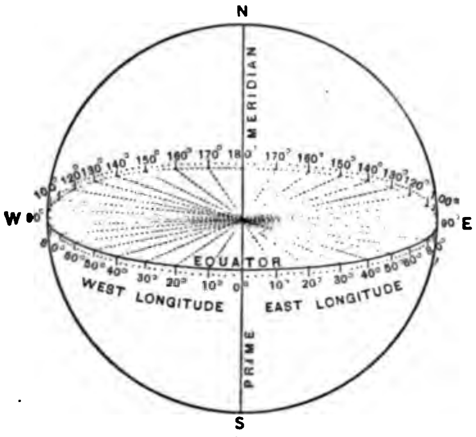
How many degrees are there in one fourth of a circle? In half a circle? In one sixth of a circle?

The distance from the equator to either pole is ninety degrees (90°), or one fourth of a great circle running north and south around the earth. The tropic of Cancer is 23½° north of the equator, and the tropic of Capricorn is just as far south of the equator.

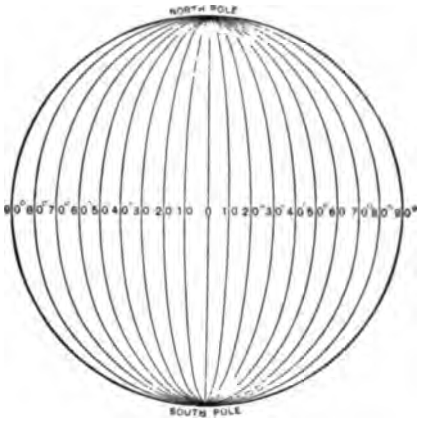
How far are the polar circles from the poles? How far are those circles from the equator?

The tropics and the polar circles are parallel with the equator, and are therefore called *parallels*. We may think of other parallels at 1°, 10°, 30°, or any number of degrees as high as ninety, from the equator.

Parallels show how far places are north or south of the equator. Thus the city of New Orleans is 30° north of the equator, - written 30° N. That city is at one third the distance from the equator to the north pole. *See colored map of North America.* There are many other places on the same parallel, or at the same distance from the equator.



Degrees of Longitude.



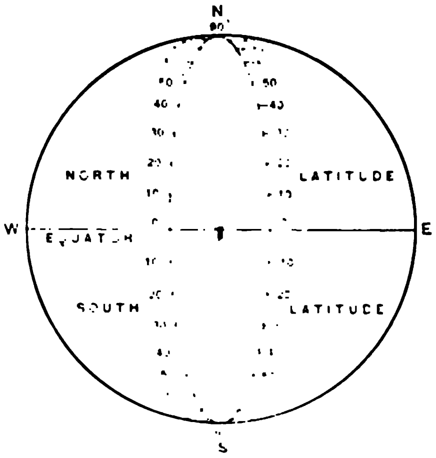
Meridians of Longitude.

All places on any one of the north-and-south lines running from pole to pole have midday at the same time. These lines are therefore called *meridians*, meaning *midday lines*.

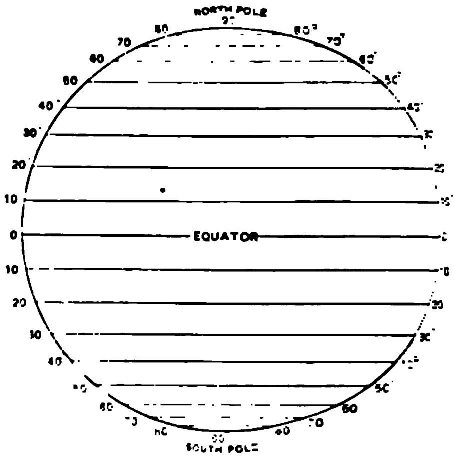
Lightning.

We may think of any number of meridians and number them, beginning with either of them. The line with which the numbering begins is called the *prime* meridian, meaning the *first*.

The prime meridian most commonly used by sailors passes through *Greenwich*, near London. This is known as the *meridian of Greenwich* and is marked 0° on the maps. *See colored map of British Isles.* The meridians which show degrees are generally numbered from 1 to 180 east from Greenwich, and also from 1 to 180 west. These numbers count the degrees around the equator or the parallels.



Degrees of Latitude.



Parallels of Latitude.

New Orleans is on the meridian 90° west of Greenwich, — written 90 W. Knowing both the parallel and the meridian of that city, we may locate it at 90° W. and 30° N.

The number of degrees at which any place lies north or south of the equator is called the *latitude* of that place. The number of degrees at which any place lies east or west of a given prime meridian is called the *longitude* of the place.

*Latitude* means the *broad way*; *longitude* means the *long way*.

In ancient times, when nearly all the shipping in the world was on the Mediterranean sea, the *long way* was east and west; the *broad way* was north and south.

What is the latitude of New Orleans? What is its longitude? Find out the latitude and longitude of the town or city in which you live.

What is the latitude of the tropics? Of the polar circles?

## 28. Winds and Rainfall.

*Winds.* Cold air, being heavier than hot air, flows towards and creeps under the hot air, pushing it upwards.

As all parts of the earth are not heated alike, the air is kept in motion. Some of the currents of air move along the earth's surface, and others flow far above it. The *winds*, or surface currents, are the more important to know, as they gather moisture for the lands and do many other kinds of useful work.

Arctic Snow Crystals.

Wide currents of air flow into the hot belt from the regions on both sides. If the earth did not rotate, each of these currents would flow due south or north, towards

---

[1] A 60th part of a degree is called a *minute*. A 60th part of a minute is called a *second*. Ten degrees, thirty minutes and forty seconds may be written — 10° 30′ 40″.

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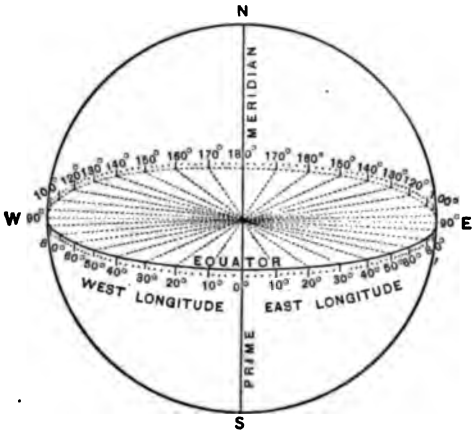
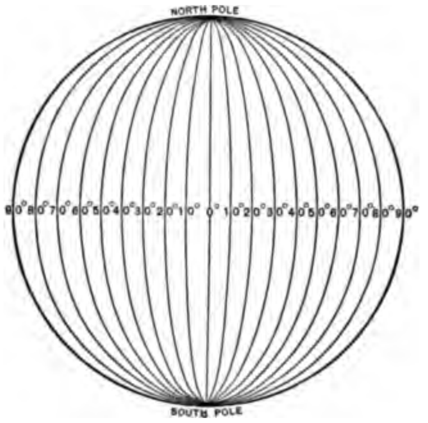


**Degrees of Longitude.**



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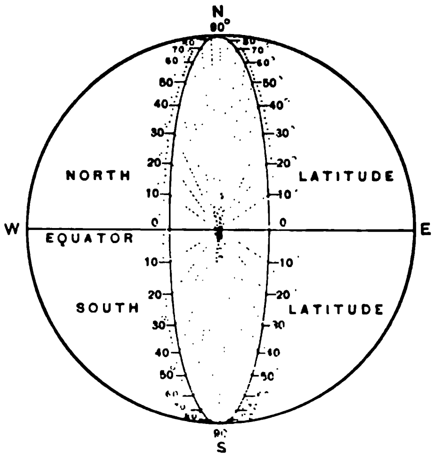
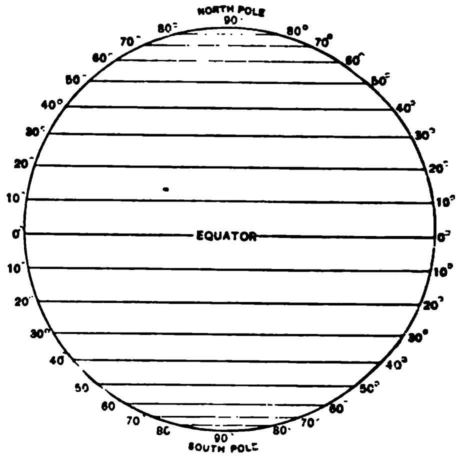
**Lightning.**



**Degrees of Latitude.**



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### 28. Winds and Rainfall.

*Winds.* Cold air, being heavier than hot air, flows towards and creeps under the hot air, pushing it upwards.

As all parts of the earth are not heated alike, the air is kept in motion. Some of the currents of air move along the earth's surface, and others flow far above it. The *winds,* or surface currents, are the more important to know, as they gather moisture for the lands and do many other kinds of useful work.

**Arctic Snow Crystals.**

Wide currents of air flow into the hot belt from the regions on both sides. If the earth did not rotate, each of these currents would flow due south or north, towards the heat equator. The turning of the earth on its axis turns these winds westward, so that they flow into the hot belt from the northeast and the southeast.

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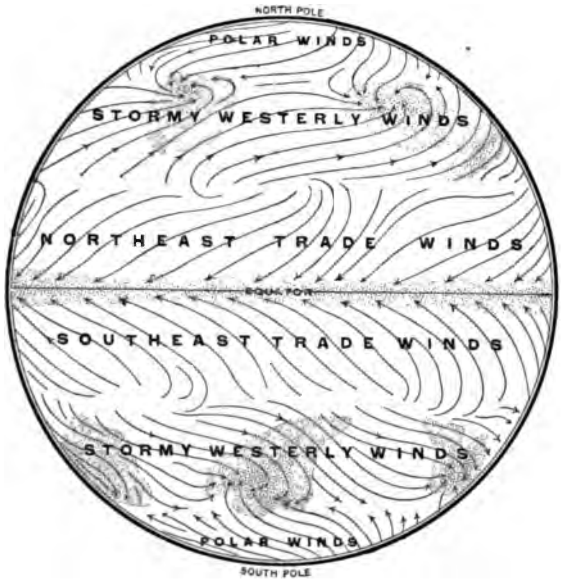
[1] A 60th part of a degree is called a *minute.* A 60th part of a minute is called a *second.* Ten degrees, thirty minutes and forty seconds may be written — 10° 30′ 40″.

These winds are called the *trade winds*. On the oceans they are very steady, and blow with little change by day or by night. The trade winds are seldom interrupted by bad weather or storms.



**General Plan of the Winds.**
(The dotted areas indicate rain.)

Every wind takes the name of the direction *from* which it blows. The trade winds blow *from* an easterly direction and are therefore called *easterly winds*.

The word *trade* (compare *tread*) once meant a trail or path. The trade winds took their name from the steadiness with which they follow a path across the sea, and not from the fact that they are helpful to commerce or trade.

Between the northeast and the southeast trade winds there is a narrow belt where the winds are weak and irregular, often dying away to a calm.

This narrow belt of weak winds lies along the heat equator and shifts north and south with it. This belt is the region where the air from the trade winds becomes hottest and lightest and is therefore slowly lifted up into the upper atmosphere.

Outside the trade wind path, the winds of the warm and the cool belts vary in direction from time to time and are often stormy, but they blow mostly from the west and are therefore called the *westerly winds*.

Between the westerly winds and the trade winds there are weak, irregular winds that generally have dry weather.

The storms of the westerly wind belts are great whirls, or *eddies*, that drift along to the eastward over the sea and the land. In these eddying winds are broad areas of clouds, often yielding rain or snow.

The round map on this page illustrates some of the eddying storms on their way across the cool and the warm belts on both sides of the equator.

In the cold belts, the winds are variable and often stormy. They generally blow in about the same direction as the trade winds, — most frequently from the northeast in the north polar region, and from the southeast in the south polar region. These are called *polar winds*.

*Rainfall.* When the air is cooled it cannot hold so much vapor as when warmer. When cooled enough, the vapor in it forms clouds, often with rain or snow. When the air grows warmer it can hold more vapor, and no clouds then form in it.

The trade winds blow towards the heat equator and therefore do not give out rainfall unless they are chilled on the way. Lowlands in the path of these winds are generally dry, but the windward sides of highlands in the trade wind belts receive abundant rainfall.[1]

When air rises to cross highlands, it expands and cools. Some of its vapor may then be condensed into clouds which may yield rainfall on the slopes of the highlands.

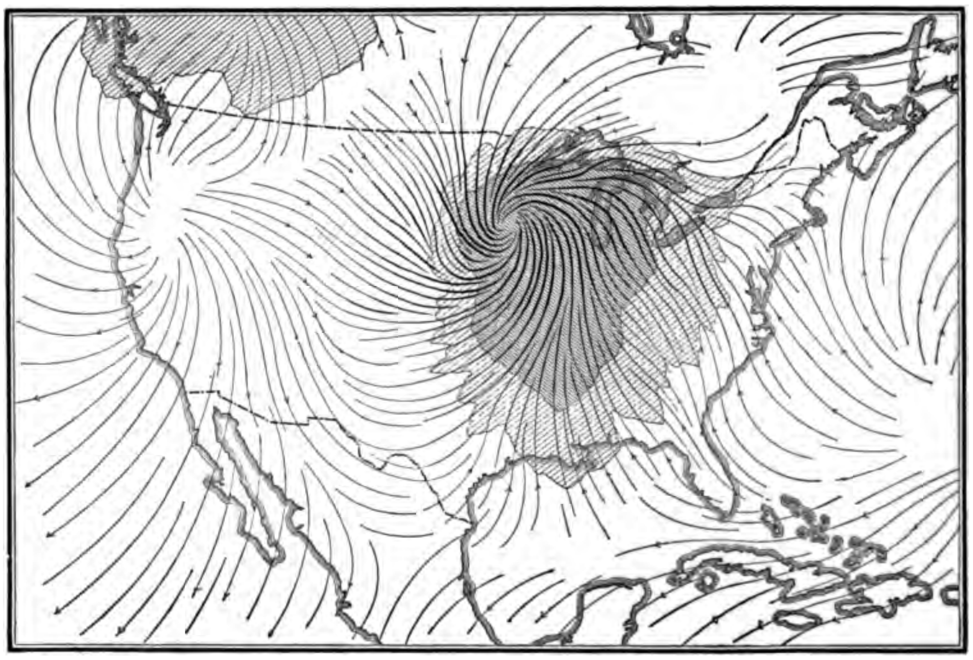
Some of the great deserts in the world are lowlands in the path of the trade winds. In desert regions the winds gather so much dust that the sky is pale-blue or even gray.

There is a very large amount of vapor in the equatorial belt of weak winds, and almost every afternoon or evening, when the warmer air rises most actively, rains pour down, with thunderstorms and squalls. This rainy belt is called the *equatorial rain belt*.

The rains of the equatorial belt *on the land* often occur late at night, as if condensed by the cooling of the tops of the clouds which last over from the afternoon.

So much rain falls in the equatorial rain belt that the surface water of the oceans in this belt is a little less salt than the oceans under the drying trade winds.

On highlands and on windward coasts the rainfall from the storms of the westerly winds is very heavy. Far inland the rainfall is much lighter.



**Eddying Storm moving eastward across the United States.**

NOTE. — The arrowheads show that the winds are eddying towards the storm center, where the dark shading shows the rain area, and the lighter shading the cloud area. The winds, rains and clouds are whirling eastward. The small map on this page shows several of these storm eddies. See maps on the next page also.

The above map shows a storm eddy crossing our country. As the cloudy and rainy eddy drifts eastward, clear weather follows it.

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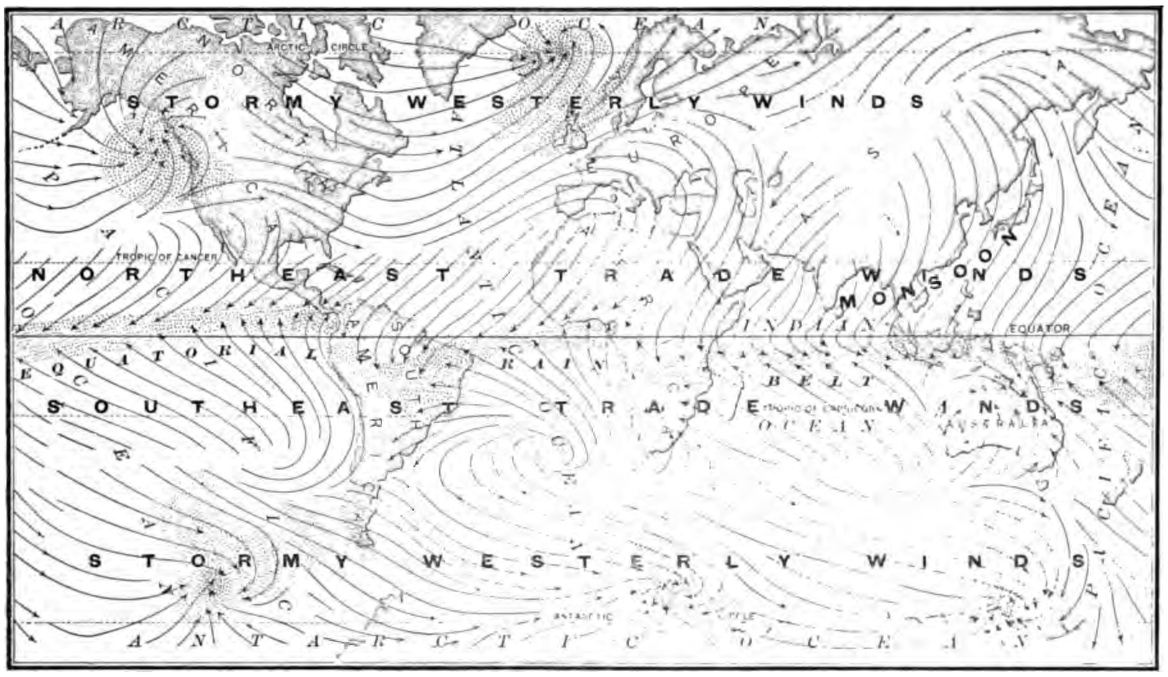
[1] The term *rainfall* includes rain, snow, hail and all other forms of falling water or ice.

The winds in an eddy whirl faster than the storm center moves forward in its path. Waves caused by the whirling winds run ahead of the storm and often give warning of its approach.



Winds and Rains of January — Northern Winter.

The westerly winds blowing inland from over the oceans are neither hot in summer nor cold in winter. The great bodies of water over which they blow, and from which they get their moisture and warmth, have nearly the same temperature both in winter and in summer. The westerly winds, therefore, give an even temperature to the western coasts of the continents in the warm and the cool belts.

The western coast of our own country owes the mildness of its climate to the westerly winds from over the Pacific ocean. Western Europe also has a more even temperature than the inland regions farther east.

## 29. Winds and Rains of Winter and Summer.

The *equatorial rain belt* lies along the *heat equator* and shifts north and south with it. This rain belt is north of the true equator in July, and mostly south of it in January. When the heat equator and the rain belt move away from a region, the drying trade winds blow there, and a dry season follows the wet season.

Some places on or near the true equator are visited by the rain belt twice each year, — once as it moves north, and again as it goes south. Such places have two wet seasons and two dry seasons yearly.

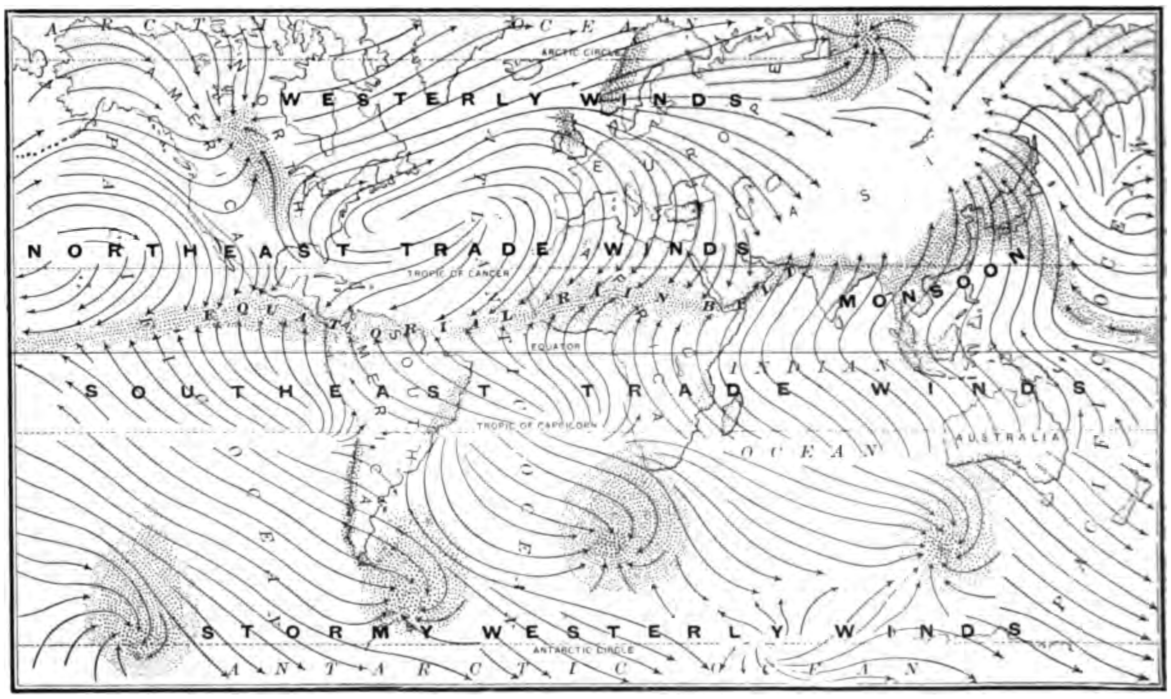
Lowlands that are reached by the equatorial rain belt when it is farthest north or south have a short wet season and a long dry season. Wet weather prevails only while the rain belt is over these places. Dry weather comes when the rain belt moves away and the trade winds prevail.

In the lowlands having the single rainy season each year, grass and flowers grow in abundance while the wet weather lasts, but in the dry months the vegetation withers away. In some places the ground then becomes parched and dry, like a desert.

The trade winds blow towards the heat equator. Where these winds cross the true equator to reach the heat equator, they change their direction, as shown on the maps.

When the heat equator reaches southern Asia, the southeast trade winds cross the equator and flow as southwest winds towards that continent. While the heat equator is in the south, the northeast trade winds blow from Asia, and on crossing the equator become northwest winds, as shown on the above map.

Winds that reverse their direction in opposite seasons are called *monsoons*, or *season winds*.



Winds and Rains of July — Northern Summer.

Since the belts of trade winds shift north and south at about the same time that the heat equator shifts, the outer borders of these belts are farther from the true equator in summer than in winter.

During the northern summer, when the border of the trade wind belt is farthest north, the regions south of the equator have their winter, and therefore the southern border of the trade wind belt is then nearest the equator. As the southern summer approaches, the southern border of the trade wind belt moves away from the equator.

The westerly wind belts shift north and south with the belts of trade winds. As a result, some places feel the steady trade winds in summer and the stormy westerly winds in winter. Such places have dry summers and wet winters.

In winter a large part of the west coast of North America and all the west coast of Europe receive rainfall from the stormy westerly winds. In summer the trade winds extend over the southern parts of these coasts and cause drouths.

Parts of the west coasts of the three southern continents have similar changes from winter to summer.

The westerly winds and their storm eddies are strongest in the winter season. That is the time when the coasts and the mountains on which they blow receive the most rainfall,—rain or snow. The western coast lands of continents in the cool and the warm belts, therefore, have their heaviest rainfall in winter.

During the summer season, the westerly winds are less active and their storms are weaker and fewer.

In winter the air over the northern continents is cold and heavy.[1] In that season, therefore, the winds from over the sea do not reach the interior of the continents so easily as in summer when the air over the land is warm and light. For this reason, the interior regions of the northern continents receive their rainfall chiefly in summer.

### 30. Ocean Currents.

Winds blowing day after day for a long time against waves in the sea cause the surface water to drift slowly along and thus form *ocean currents*. These currents move much more slowly than the winds or the waves.

In each ocean the currents move in the general direction of the winds over them. The trade winds blow the ocean currents westward, and the westerly winds blow them eastward. The lands prevent the currents from moving round and round the earth and require them to circle around, or eddy, in each ocean.

The Atlantic and Pacific oceans have eddies both north and south of the equator. The Indian ocean has a large eddy south of the equator, but the ocean currents north of the equator flow back and forth with the season winds, or monsoons, which prevail over that ocean.

The ocean eddies north of the equator move slowly in the direction in which the hands of a clock turn. The ocean eddies south of the equator move in the opposite direction, or against the hands of a clock.

In the southern cool belt the oceans spread all the way round the earth. There the drifting waters on the southern sides of the Pacific, Atlantic and Indian eddies unite to form a great current sweeping slowly towards the east. This current flows entirely around the Antarctic ocean and may be called the *Antarctic eddy.* It receives cold water from the south polar ocean.

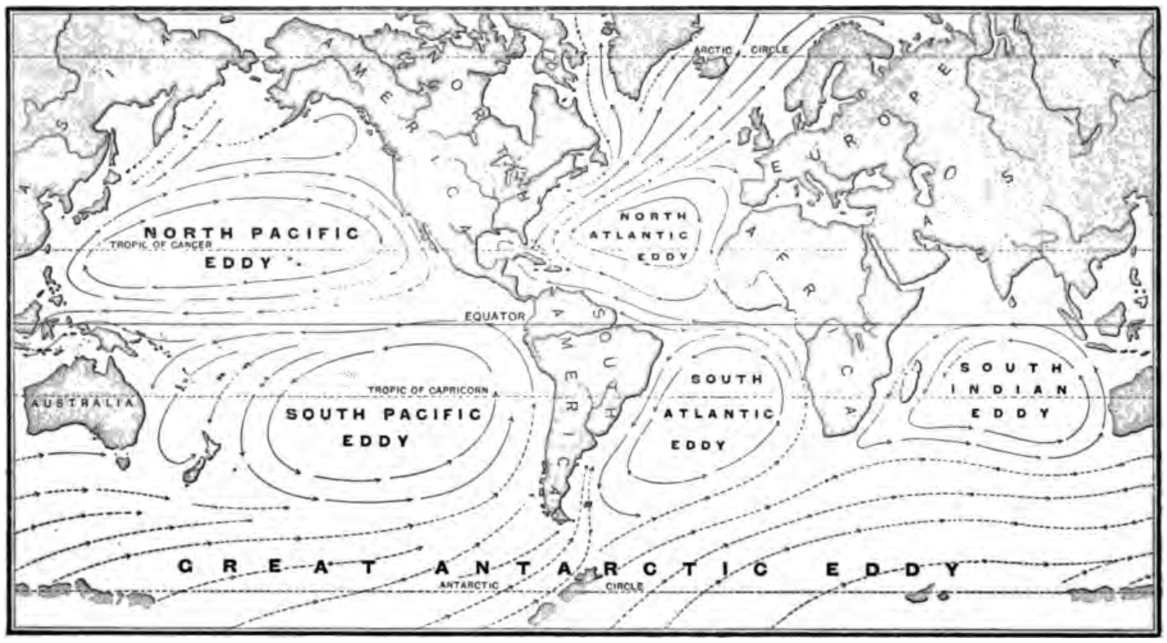


**Chart of the Ocean Currents.**

Ocean currents that move slowly over a broad surface are called *drift currents*. These seldom flow more than a mile an hour. Currents that are driven through narrow passages may move three or even four miles an hour. These rapid currents are called ***streams***.

Part of the water of the North Atlantic eddy flows between the island of Cuba and the mainland of North America. The current issuing from this passage is called the *Gulf stream*. Joining the rest of the eddy, the Gulf stream spreads as a broad drift far to the northeast. Part of this drift turns back southward into the hot belt, and part branches towards the Arctic ocean.

The large branch of the North Atlantic eddy which runs northeastward into the Arctic ocean bears much warmth to it. A cold current from the Arctic ocean flows southward along the northeast coast of North America.

As we study the different continents we shall learn of other currents that warm or cool the air flowing towards the land.

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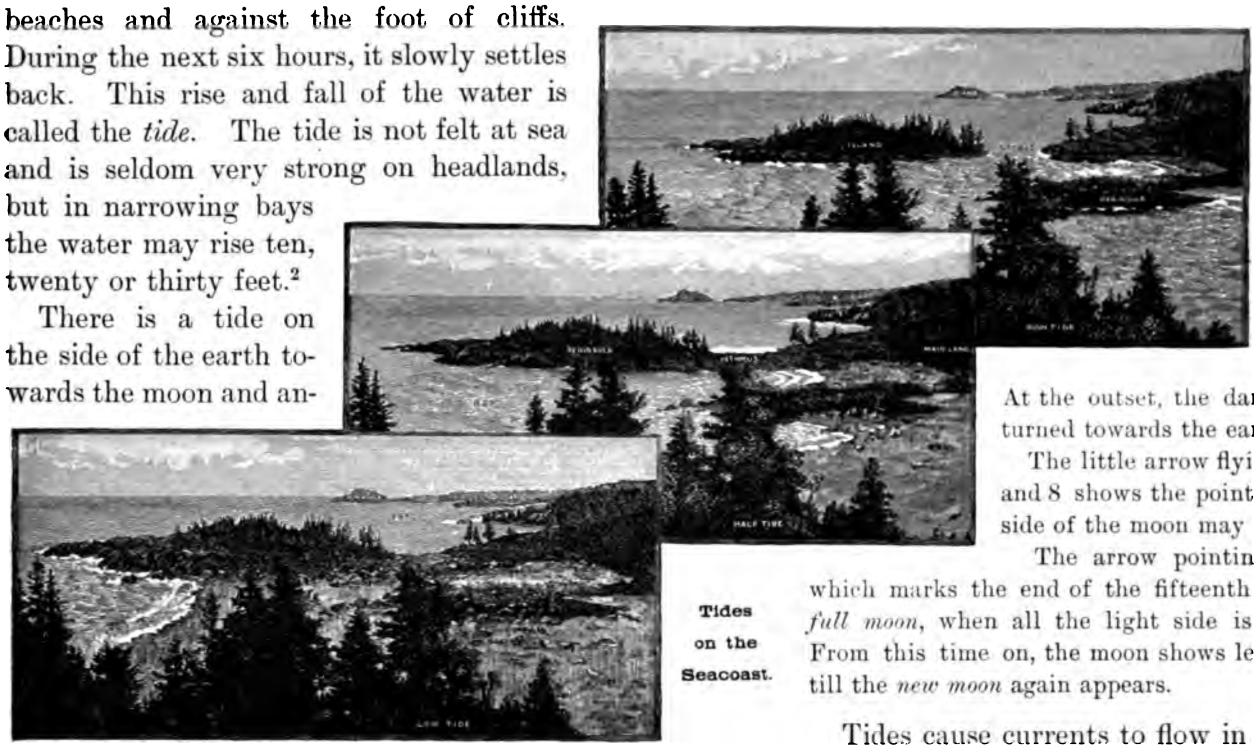
[1] The places of greatest cold in winter are not over the Arctic ocean, but at some distance southward from the Arctic coasts of Asia and North America. In that season therefore the polar winds do not flow inland over the continents, to any great extent, but are pushed out from the lands. In summer, when the inland regions are very warm and when the air over them is light, the polar winds reach farthest into the northern lands.

## 31. The Moon and the Tides.

Twice each day,[1] the ocean slowly rises and falls on its shores. For about six hours, the water creeps up the beaches and against the foot of cliffs. During the next six hours, it slowly settles back. This rise and fall of the water is called the *tide.* The tide is not felt at sea and is seldom very strong on headlands, but in narrowing bays the water may rise ten, twenty or thirty feet.[2]

There is a tide on the side of the earth towards the moon and another on the opposite side. The tides are caused chiefly by the attraction of the moon, but partly also by the sun



**Tides on the Seacoast.**

At all times there are two faint bulges of high tides whose broad wave-forms travel swiftly across the oceans. In the open oceans the tides follow the movements of the moon, but on reaching the shallow waters near the margin of the lands, the tides increase in height and advance much more slowly, — lagging far behind the moon.

As the earth turns on its axis, the moon *seems* to revolve round it from east to west. The moon holds in place the great tidal wave-forms, while the earth turns on its axis. Thus, it is the turning of the earth which makes the two tides appear *daily*, just as it makes the sun rise and set.

**The Crescent Moon.**

If you will note the time of the moon's setting, you will find that it is nearly an hour later each day, showing that the moon's position is farther east each successive night at a given hour, and that the earth must rotate almost an hour longer than a day, in order to make the moon set. This is the reason why the tides are nearly an hour later each day

The moon goes round the earth from west to east in about a month. The long diagram on this page shows the path of the earth and the moon for nearly one month, on their way round the sun. The larger circles, half light and half dark, indicate the position of the earth each day; while the smaller circles indicate the position of the moon. The days of the month are numbered, — 1, 2, 3, etc.

The groups of arrows pointing downward represent the sun's rays and show why the upper sides of the earth and the moon in the diagram are light. At the outset, the dark face of the *new moon* is turned towards the earth.

The little arrow flying upwards between days 7 and 8 shows the point where one half of the light side of the moon may be seen from the earth.

The arrow pointing upwards near the figure which marks the end of the fifteenth day, shows the position of *full moon*, when all the light side is turned towards the earth. From this time on, the moon shows less and less of its light side, till the *new moon* again appears.

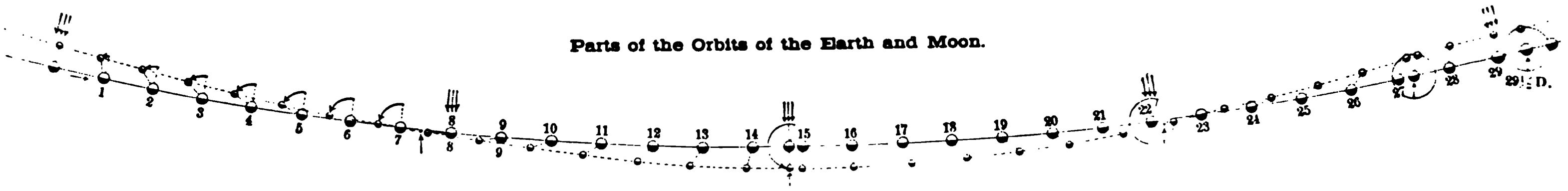
Tides cause currents to flow in and out of bays. Tidal currents help to scour the mud and sand from the bottom of shallow bays and to wash the rock waste farther away from the shores. Twice a day these currents carry sea water into and out of the bays and thus keep them pure.

The flowing in of the tide is called its ***flood;*** the flowing out is its *ebb.*

**The Bore or Tidal Wave (Seine River, France).**

It is important to know when high or low tides occur in different harbors, for the tidal currents are of great assistance to vessels sailing in or out. At the mouths of some harbors the water at low tide is not deep enough for vessels to enter. They must then wait for the high tide.

**Parts of the Orbits of the Earth and Moon.**



In some narrowing bays and river mouths, the tide forms a high wave followed by several smaller waves. These roll in with great speed and often do much damage. Such a wave formed by the tide is called a *bore.*

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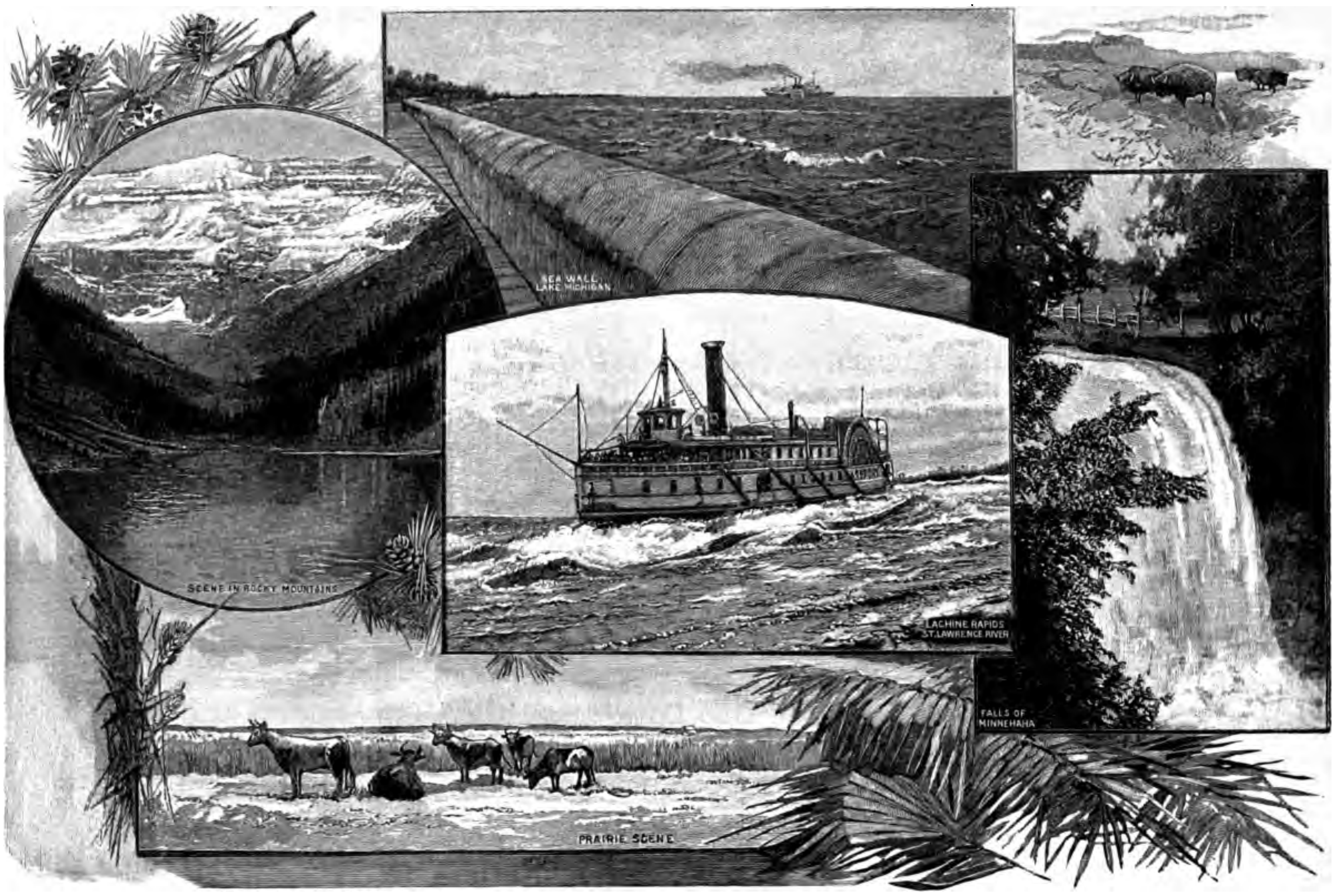
[1] More exactly, in 24 hours and 50 minutes.

Some places have but one tide a day, and others have more than two tides in that time.

[2] In rare cases it rises sixty feet.



# NORTH AMERICA.

## 32. North America.[1]

North America is broad in the north, but it tapers towards the south. This continent covers nearly one twentieth of the earth's surface.[2]

North America consists mainly of a great western highland, a lesser eastern highland and a central plain.

This continent crosses the warm and cool belts, and also enters the cold belt on the north and the hot belt on the south. Only a small part of the continent is in the hot or the cold regions. Far the greater part is in the belts having cold or cool winters and warm or hot summers.

In the warm belt the winter is short and mild, but northward the cold season lengthens, till near the Arctic coast there are only a few weeks of mild weather each summer. The extreme north of the continent is cold and dreary.

Only the southernmost part of North America is reached in summer by the equatorial rains. The highland of Mexico receives rains from the trade winds on its eastern slopes, but the western slopes are not well-watered. The wide middle portion of the continent is in the path of the eddying storms of the westerly winds.

The westerly winds from over the North Pacific eddy give a mild and even climate to the greater part of the west coast of North America, for the seasons over the broad ocean change but little.

In the interior of the continent, far from the sea, the summers are very warm and the winters very cold. There the change of seasons is much greater than near the coast.

On the east coast the winter weather is mild when the southeast wind blows from over the Gulf stream, but is very chilling when the northeast wind from over the Arctic current reaches the land or when cold air flows out from the interior of the continent.

When the cold heavy air of winter covers the interior of North America, not much moist air can flow in, and the inland rainfall is therefore not heavy. When the warm light air of summer spreads over the interior, the moist winds from the sea flow inland and give plentiful rains, except on the lowlands among the western mountains and on the plains along the eastern base of the Rocky mountains.

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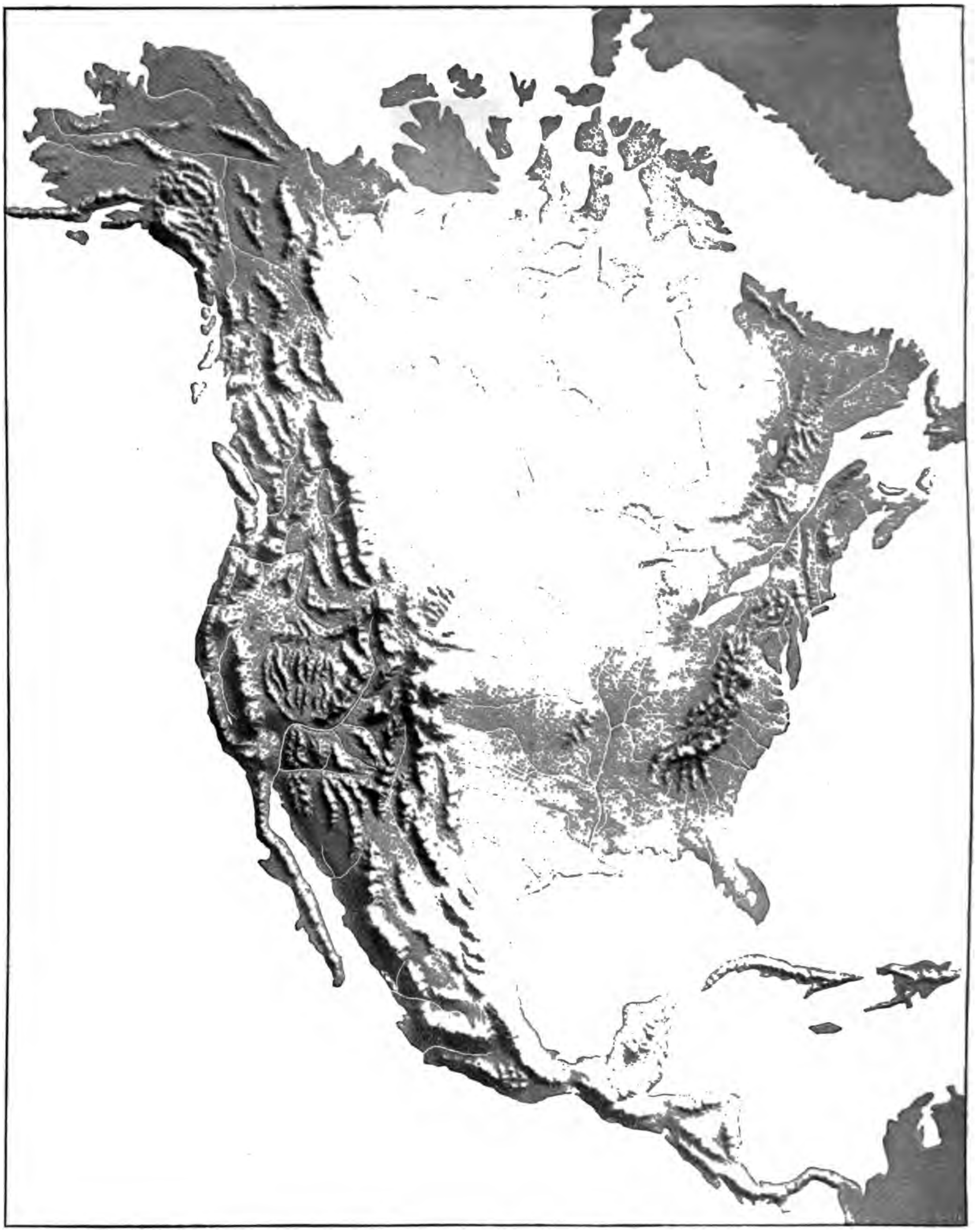
[1] The *Map Studies* on page 29 are to precede this lesson. Refer often to the relief maps. Locate every place named in the text.

[2] The area of the earth's surface is about *200,000,000* square miles,—more exactly, 197,000,000.

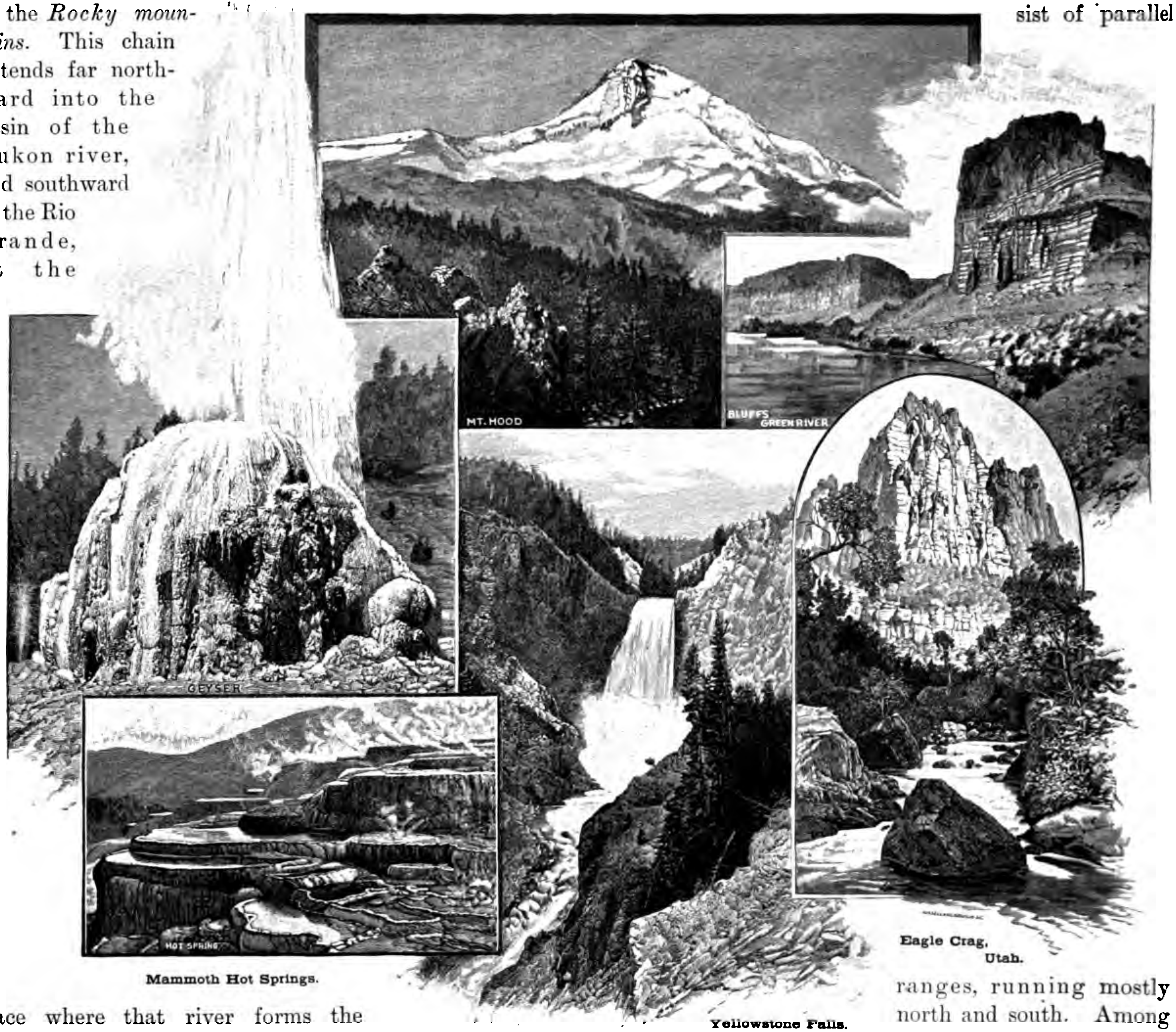


RELIEF MAP OF NORTH AMERICA.

## 34. The Rocky Mountains.[1]

The widest part of the Rocky Mountain highland is about midway between the isthmus of Panama and Bering strait.

In this broad portion, lofty ranges almost inclose a vast plateau, about a mile above sea level and several hundred miles wide. The various ranges lying along the eastern side of this plateau are known as the *Rocky mountains*. This chain extends far northward into the basin of the Yukon river, and southward to the Rio Grande, at the place where that river forms the boundary between our country and Mexico.



Mammoth Hot Springs.

Yellowstone Falls.

Eagle Crag, Utah.

In the Rocky mountains, as in all high mountains, bare crags stand out near the summits, and coarse stony waste creeps down the slopes into the valleys. The finer waste is washed farther and is spread over the lower land. The plains along the eastern base of the Rocky mountains are made of the waste which in past ages has been washed from the great range. Many of the Rocky mountain peaks are over two miles and a half high.

Where are the Laramie plains? *See map on page 32.* These plains are in a high plateau region that interrupts the Rocky mountain chain. The route of the first railroad built across our country leads over the Laramie plains.

South of the Laramie plains the Rocky mountains consist of parallel ranges, running mostly north and south. Among these lie many high plains known as *parks*. The parks are lofty basins shut in by ranges on nearly all sides.

Among these are the *North*, the *Middle*, the *South*, and the *San Luis* parks. Each of these contains several hundred square miles of land that is quite level and is covered with rock-layers made of waste washed from the surrounding mountains. Some parts are wooded, and other parts are grassy or rocky.

The parks are drained by rivers that have cut deep and narrow valleys, or *canyons*, through the ranges. The sources of the Platte, the Arkansas, the Colorado and the Rio Grande are in this park region. Railroads through this rough country often follow the canyons, but the wagon roads generally lead over the passes in the mountains.

---

[1] The surface of the United States, occupying a broad belt across the middle part of North America, is treated much more at length than any other part of the earth, not only because we ought to know the geography of our own country, but also because the full knowledge of the surface and resources of our land affords the best key to its history.

Among the famous mountains of this region are Pikes peak and Longs peak. These rocky masses, patched with snow, may be clearly seen from the plains on the east of the great chain.

The Wasatch range rises along the western part of the Rocky mountains. The Colorado river receives streams from the east slope of the Wasatch range.

From the region of the Laramie plains the Rocky mountains bend towards the northwest and there the great western highland of the continent becomes narrower.

Where is the Wind River range? This high range contains sources of streams that belong in three large river systems, — the Colorado, the Columbia and the Mississippi.

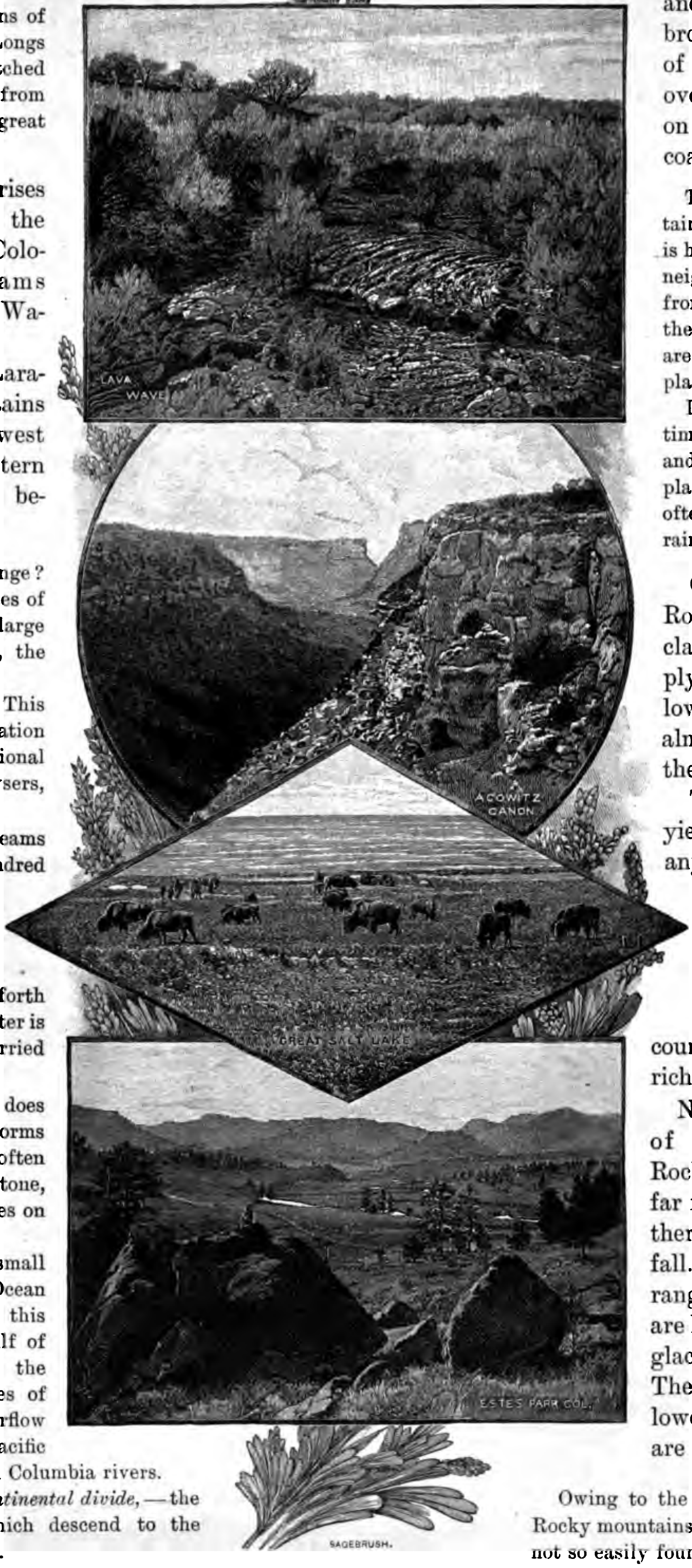
Locate the Yellowstone park. This park has been reserved for the nation and is therefore called a "national park." It is famous for its geysers, hot springs, falls and canyons.

Some of the geysers throw streams of hot water more than two hundred feet into the air. Steam escapes with loud roaring and makes the ground tremble. The water in some of these fountains falls back into basins, to be belched forth again. In other geysers the water is broken into fine spray and is carried away by the wind.

In many basins the water does not spout but only rises and forms pools, or hot springs. These often overflow and make terraces of stone, like those in one of the pictures on the opposite page.

In Yellowstone park is a small body of water known as Two-Ocean pond. In ordinary weather this pond finds an outlet to the gulf of Mexico, through branches of the Mississippi river; but in times of heavy rains, part of the overflow from the pond reaches the Pacific ocean, by way of the Snake and Columbia rivers.

Two-Ocean pond is on the *continental divide,* — the divide between the slopes which descend to the Atlantic ocean and the Pacific.



The rainfall is not very heavy on those parts of the Rocky mountains which are in the United States, because the great chain lies far away from the sea, and much of the moisture brought by the eddying storms of the westerly winds from over the Pacific ocean is lost on high ranges near the Pacific coast.

The rainfall in the Rocky mountains, as in other parts of the earth, is heavier on the ranges than on the neighboring lower lands. Streams from the mountains feed many of the rivers, and canals from these are often led out to water the plains.

In summer, thunderstorms sometimes start over the high mountains and drift eastward, watering the plains east of the ranges. Snow often falls on the mountains, while rain is falling on the lower lands.

Only small parts of the Rocky mountains are forest-clad, but even the light supply is valuable, because the lower lands of this region are almost treeless, on account of the dryness.

This deep-worn highland yields more silver ore than any other part of our country. Gold is another valuable product. The city of Denver has had very rapid growth because it is in the midst of a great grazing country on the plains and is near rich mines in the mountains.

Northward from the border of the United States, the Rocky mountains are not very far from the Pacific coast, and therefore receive plentiful rainfall. For a great distance the range is still lofty. Its summits are heavily snow-clad, and large glaciers are found on its slopes. The mountains, as well as the lower parts of the highland, are heavily wooded.

Owing to the vegetation on the slopes of the Rocky mountains in Canada, ore-bearing rocks are not so easily found there as in our own country.

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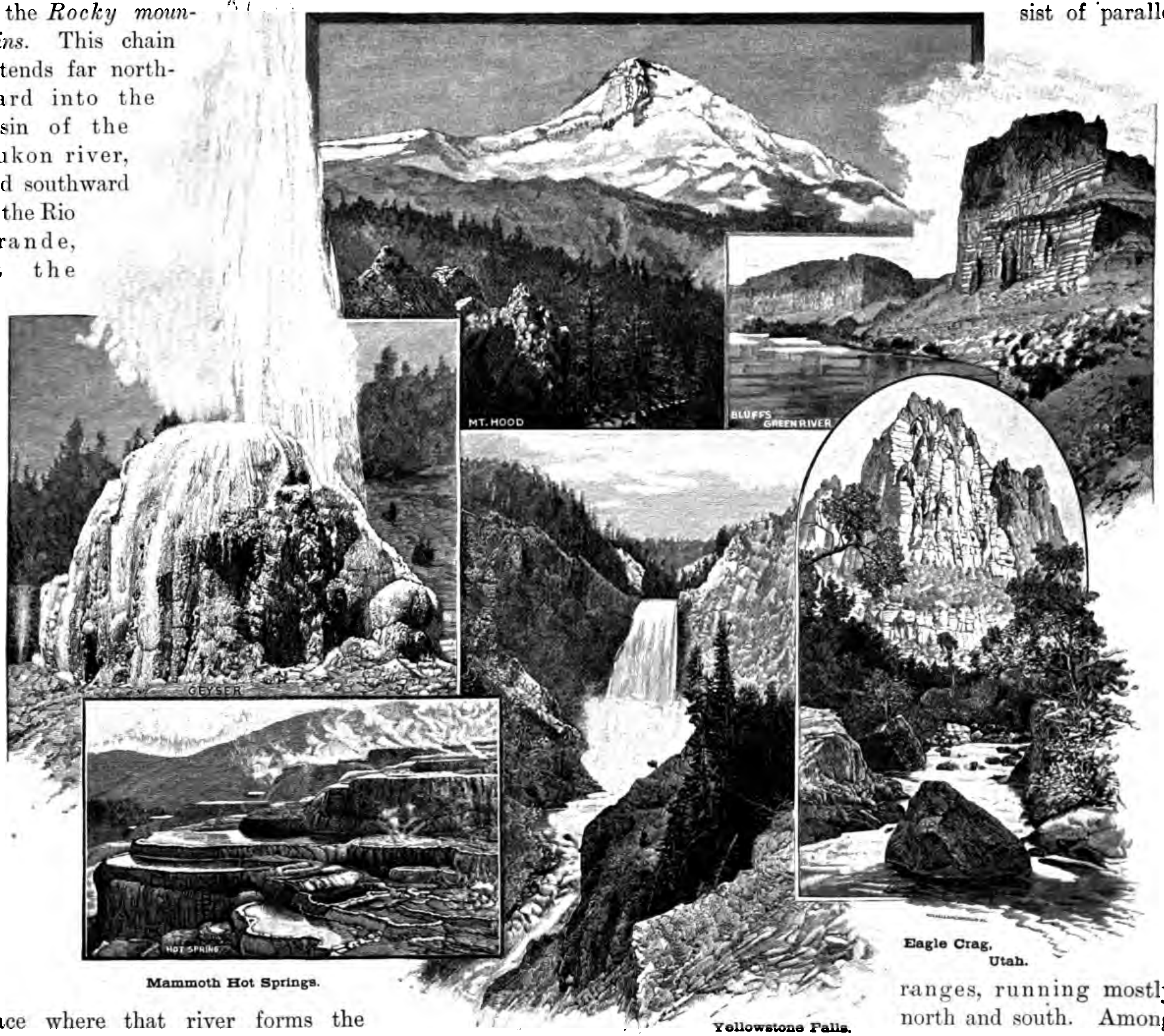

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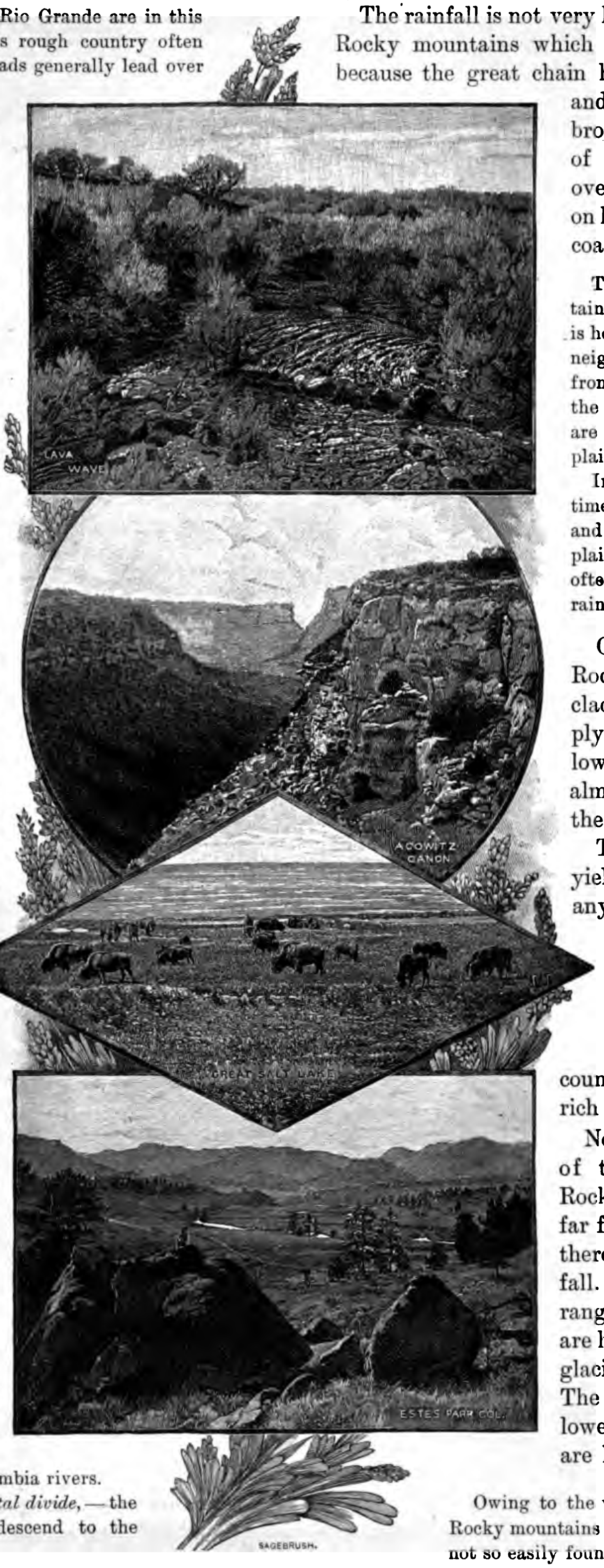

SAGEBRUSH.

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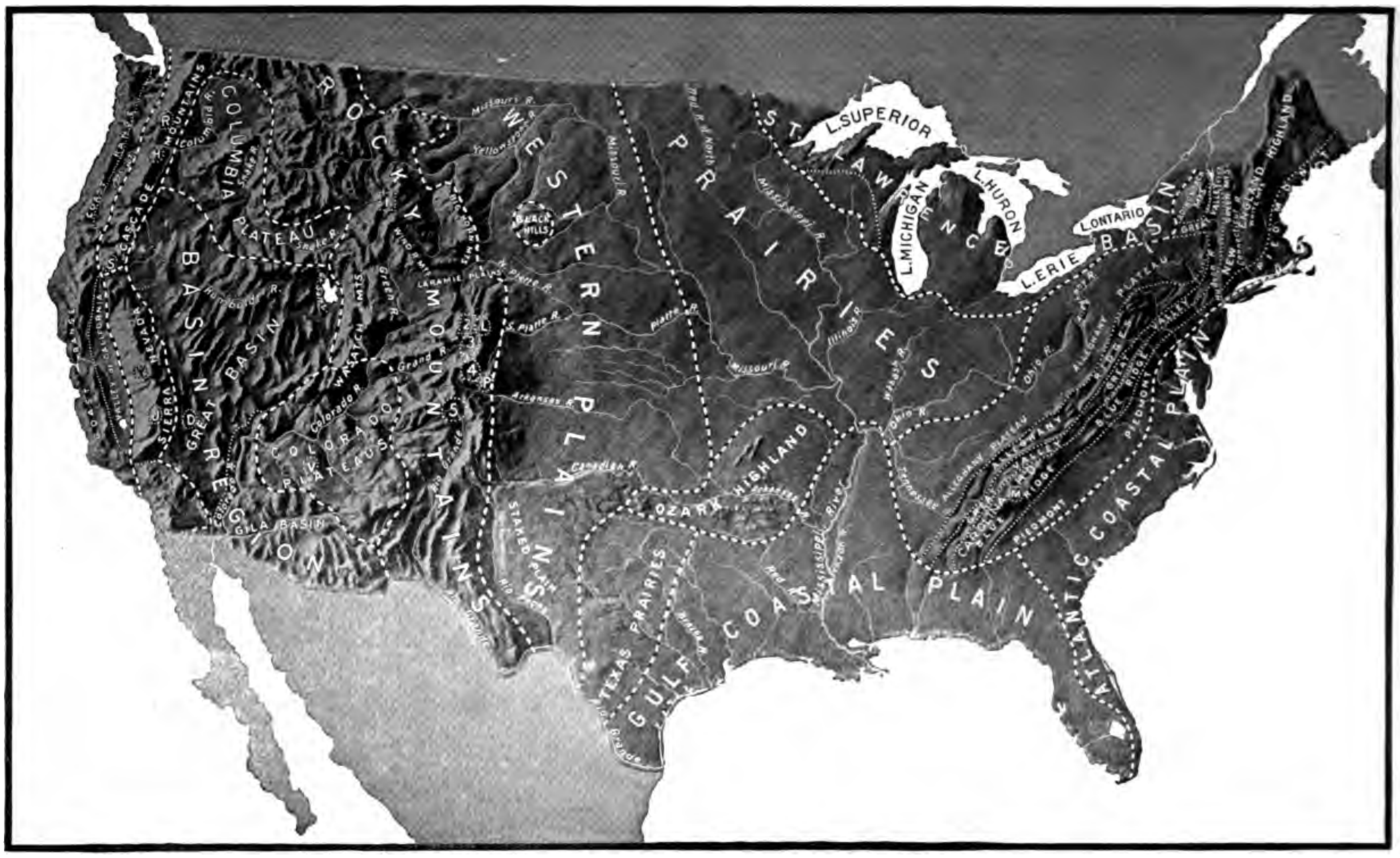

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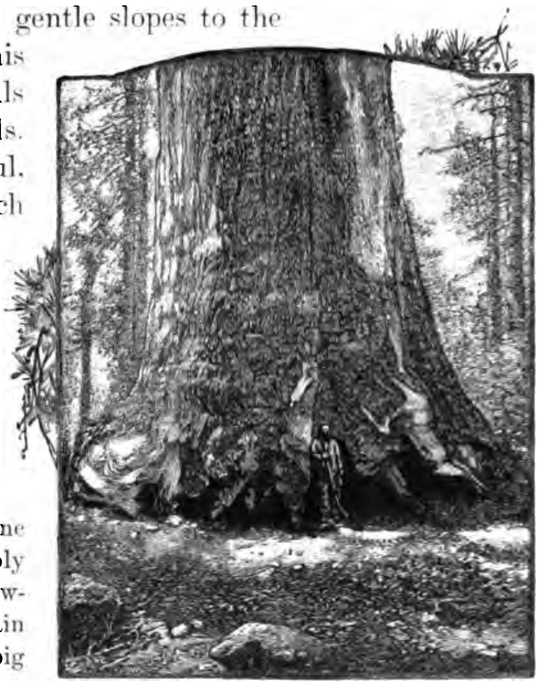
**Key to Relief Map on pages 34 and 35.**[1]

## 35. The Sierra Nevada.

Where are the mountains that form the *Sierra Nevada?* This name means *snowy range.*

The lofty Sierra Nevada rises in steep slopes from the plateau on the east, but descends in gentle slopes to the low valley plain on the west. This range receives heavy winter snowfalls from the storms of the westerly winds. In summer, the rains are not plentiful, because the trade winds then reach farther north, and storms are fewer. The summer streams from the Sierra are fed by the melting snow.

The broad uplands of the west slope of the range are heavily wooded. The east slope is drier, and its forests are therefore lighter.



California "Big Tree."

Most of the Sierra forests consist of cone trees, — pine, spruce and fir. They supply lumber to the cities and towns in the lowlands west of the range. On the mountain slopes are found groups of the famous "big trees." Some of these are more than a thousand years old and have a height of over three hundred feet. They are the largest trees known in the world. Mt. Whitney, near the southern end of the range, is higher than any known peak in the Rocky mountains.

Ages ago the Sierra Nevada was greatly worn down. When the surface reached the deeply-buried layers, veins of rock containing gold were then uncovered. There were grains and nuggets of gold in the waste which was washed from the mountains and which formed beds of gravel along their western base.

In that ancient time, volcanoes among the mountains poured forth lava that flowed down the valleys and buried the gravel of the river beds. In the ages which have since passed, the mountain region has again been uplifted and the volcanoes and the lava-flows have been greatly worn away. New valleys have been cut, and in many places the gold-bearing gravel under the lava has been laid bare. The gravel beds are now dug out for the gold which they contain.

The picture on page 123 shows how miners sometimes use water to wash down a gravel bed. The water forces the gravel down a trough, across the bottom of which are small cleats or grooves holding quicksilver. The gold is gathered by the quicksilver, and the gravel is washed away.

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[1] Key to figures and letters on the map: The heights of peaks are given in the *Supplement.*

H = Mt. Hood.
J = Mt. Whitney.
L = Longs Peak.

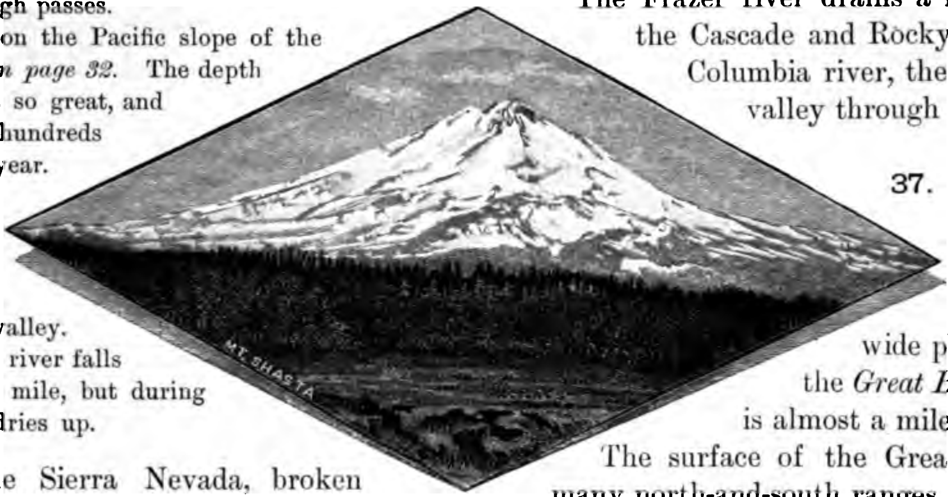
1. Yellowstone Park.
2. North Park.
3. Middle Park.
M = Mitchells Peak.
P = Pikes Peak.
R = Mt. Rainier.

4. South Park.
5. San Luis Park.
D = Death Valley.
S = Mt. Shasta.
V = Mt. San Francisco.
Y = Yosemite Valley.

**The lava-flows blocked many river valleys and thus formed lakes. In time, many of these were drained and their beds became meadows, making the best farming lands now to be found among the mountains. One river has cut a deep valley from east to west across the northern part of the Sierra Nevada. Elsewhere the range can be crossed only over high passes.**

**The Yosemite valley is on the Pacific slope of the Sierra Nevada. *See map on page 32.* The depth of this wonderful valley is so great, and its sides are so steep, that hundreds of people visit it every year.**

**In some places, its steep sides are about half a mile in height. Beautiful streams from the upland leap over cliffs into the valley. In wet seasons, one small river falls more than a fourth of a mile, but during summer drouths it often dries up.**



Southward from the Sierra Nevada, broken ranges extend into the peninsula of Lower California. This peninsula is in the dry belt along the outer border of the trade winds and is too far south to feel the westerly storms, even in winter.

### 36. The Cascade Range.

From the great volcanic cone of Mt. Shasta, the Cascade range extends far northward. As a whole, it is not so high as the Sierra Nevada.

A large part of the Cascade range is built of lava, and the highest peaks in this range are volcanoes. The sides of most of them are deeply worn, showing that a long time has passed since their lava flowed. Some of the peaks bear large glaciers. Mt. Hood is one of the highest.

**In recent years a few peaks in the Cascade range have sent out small jets of steam, and at least two craters have given forth showers of ashes, but no lava-flow has been known to take place since white men first went to the region. The lava on some peaks is very firm and has flowed so recently that it has hardly begun to weather.**

At the place where the Columbia river breaks through the Cascade range, the stream has cut a gorge down almost to sea level, draining the interior country where there was once a large lake. This deep gorge lays bare the edges of many lava sheets and shows them to be very thick.

Rapids break the flow of the Columbia river, at the place where it passes through the range. These rapids mark the limit to which vessels can ascend from the sea.

The Cascade range is so far north that even in summer the trade winds do not reach it. The storms of the westerly winds reach this range at all seasons, but the winter is the time of heaviest rainfall, as on all other coast regions in the path of the westerly winds. The mountains are covered with forests of valuable timber.

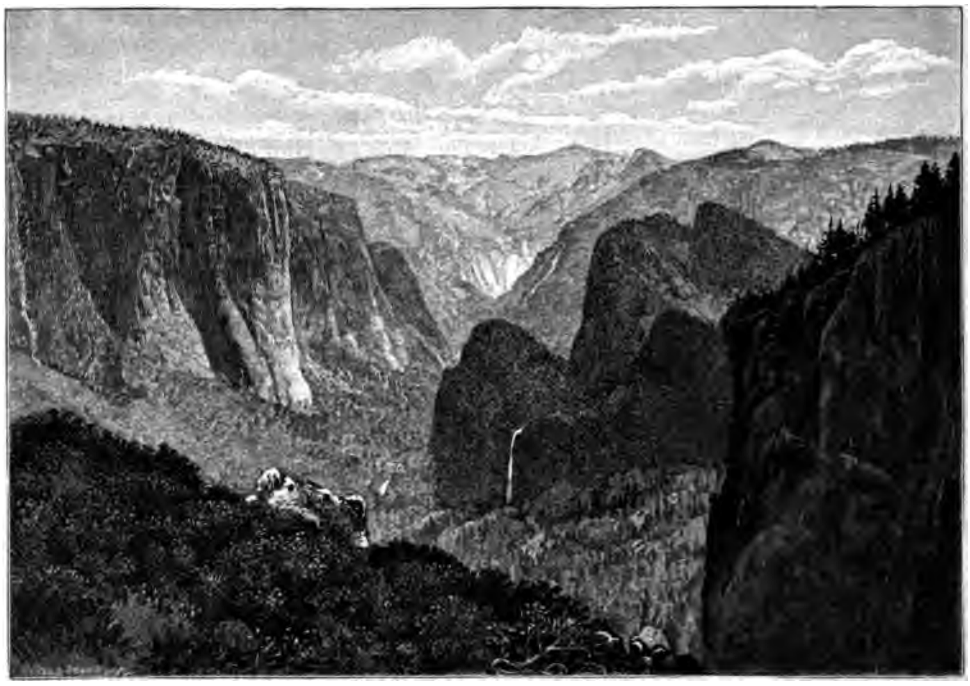
The Frazer river drains a rugged region between the Cascade and Rocky mountains. Like the Columbia river, the Frazer has cut a deep valley through the Cascade range.

### 37. The Great Basin.

Between the Wasatch range and the Sierra Nevada lies a wide plateau region known as the *Great Basin*. The central part is almost a mile higher than sea level. The surface of the Great Basin is broken by many north-and-south ranges, between which lie long *troughs* not many miles in width. The region is dry, because the high Sierra Nevada lies along its windward side.

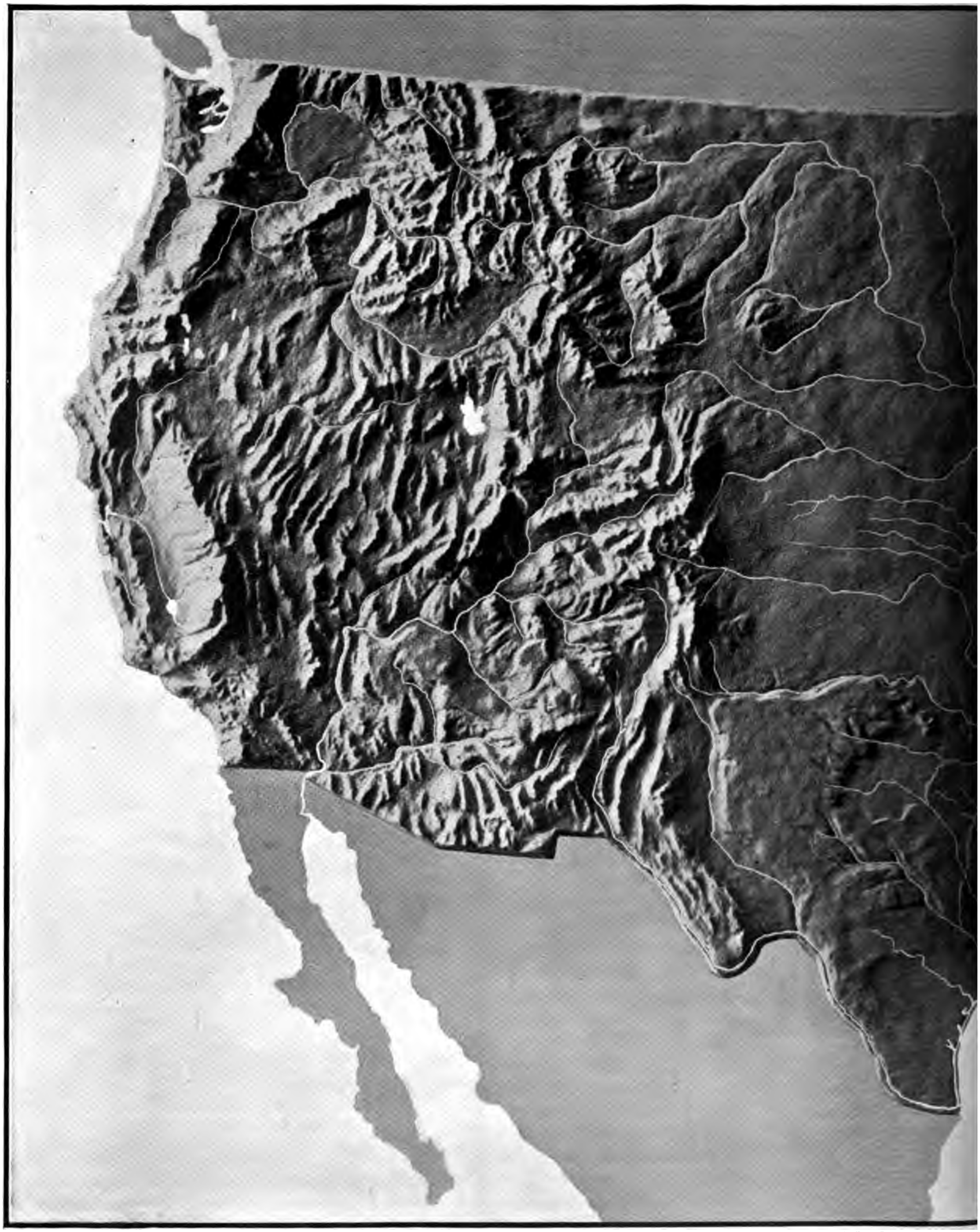
**There is more rain on the mountains than in the troughs, and streams have carved many valleys in the steep slopes of the ranges. The rock waste has been washed into the troughs, making gravelly and sandy plains. *See picture at the bottom of page 36***

**The rainfall being light, many of the mountain ranges are bare of trees, and the plains are almost deserts. In these plains, there are shallow hollows, or *sinks*. Winter rains flood the sinks and thus form lakes, but summer drouths cause the lakes to shrink. Some of the places covered by lakes in winter are smooth dry plains in summer. In these desert plains, the wind drifts the sand into dunes which often cover the surface for many miles.**



**Yosemite Valley, California.**

The streams of the Great Basin dry up on the plains or enter lakes from which the water evaporates, for there is not enough water to overflow and cut valleys in the slopes to the sea.



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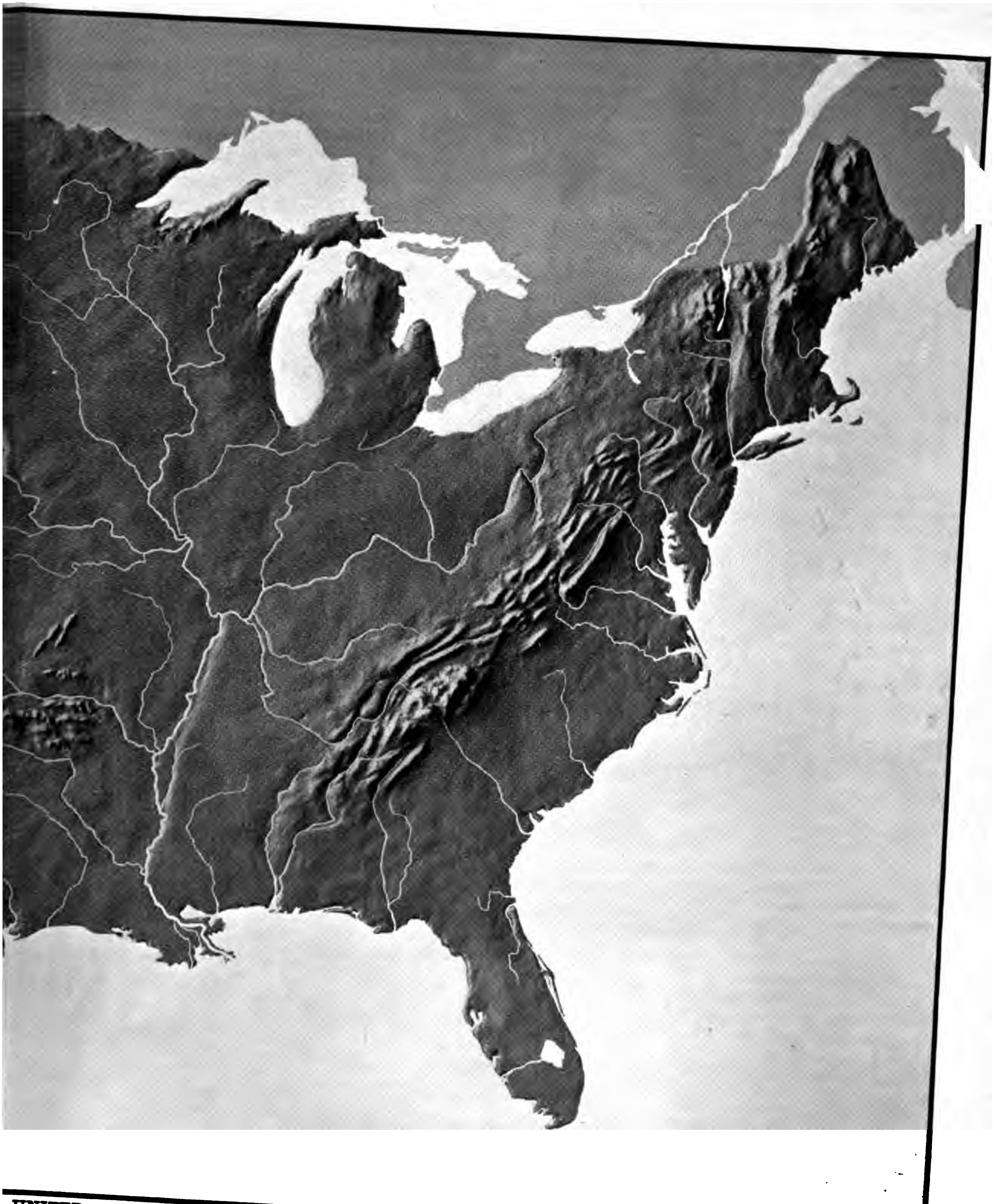
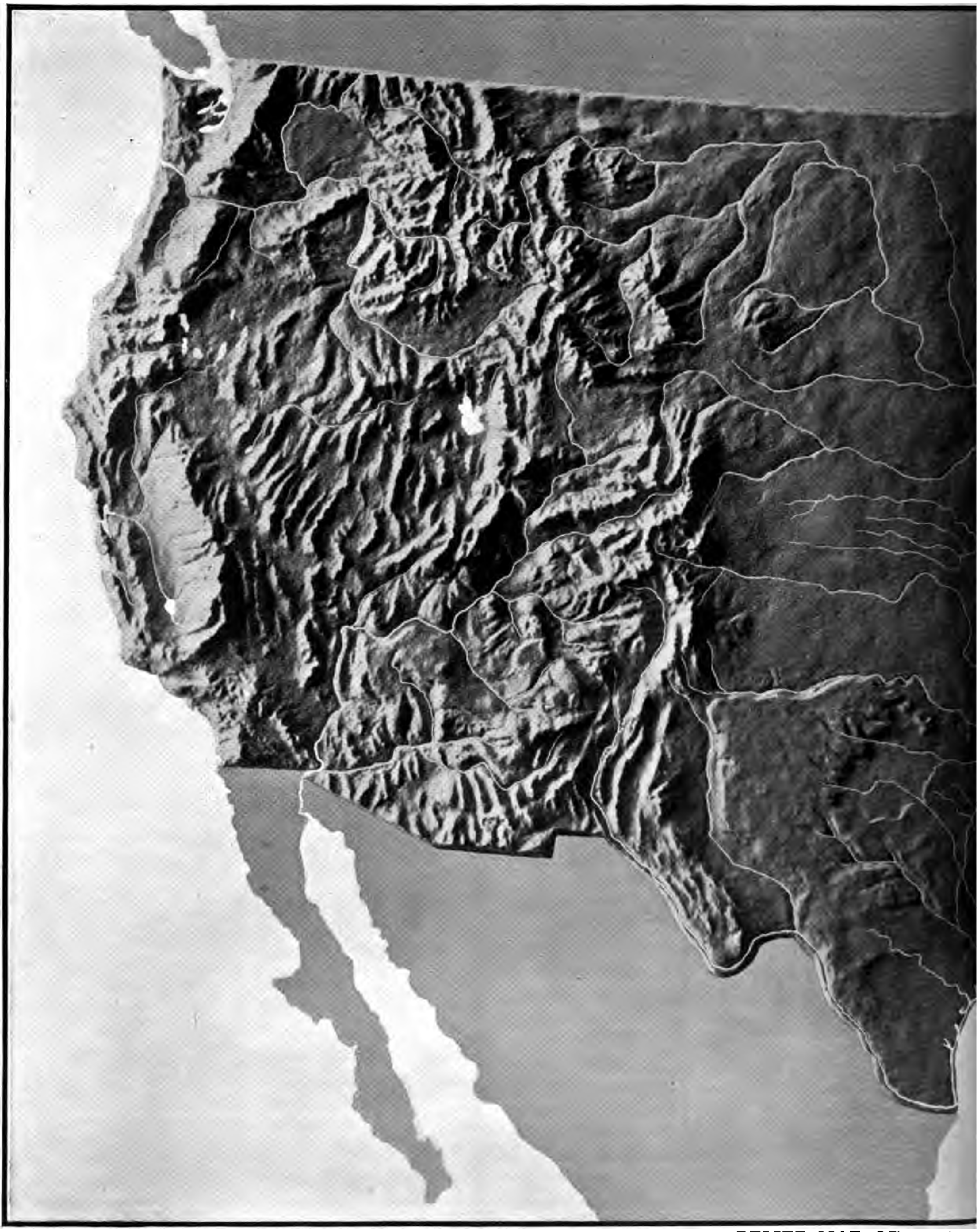


UNITED STATES.



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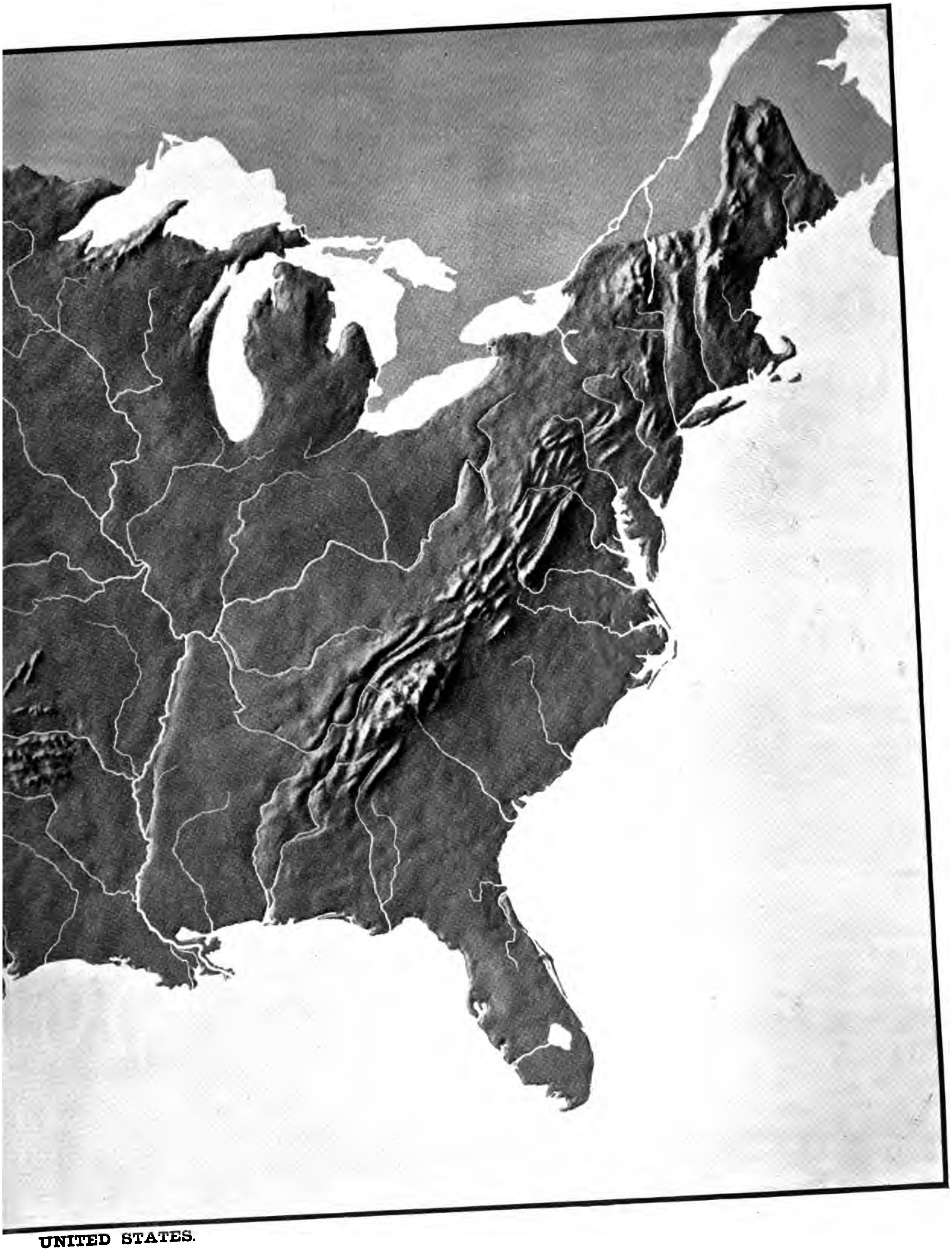
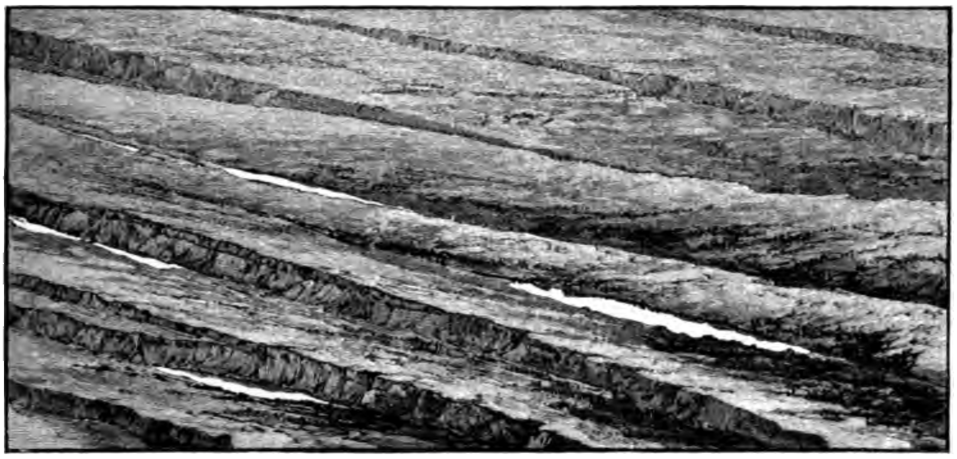


UNITED STATES.

Great Salt Lake, Utah.

The plains in the Great Basin are so dry that they are seldom covered with grass, except along the streams running from the mountains. Canals have been made to lead water from these streams to irrigate parts of the plains. A few cities and towns have grown up along the streams and canals.



Young Mountains or Tilted Blocks, — Northwest Part of Basin Region.

Some of the deep-worn ranges in this region have rich mines of gold and of silver ore. These have led to the building of other small cities and towns, but the Basin region is only thinly settled.

The streams of this region, like nearly all other streams on the earth, wash salt from the soil. The salt is formed by the weathering of certain kinds of rocks. The amount of salt carried by a river during an entire season may be very small, but if the river flows for ages into a basin having no outlet, much salt gathers there. Water standing in such a basin forms a salt lake.

There are many salty valleys and salt lakes in the Great Basin. One of these, Great Salt lake, covers an area of about two thousand square miles. This lake widens in rainy weather and shrinks in time of drouth. A cupful of its water contains a tablespoonful of salt, — more than four times the quantity in a cupful of ocean water. Salt Lake City, the largest city in the Great Basin, is near the shore of this lake.

Many centuries ago, when there was a wetter climate, a much larger body of water filled the basin in which Great Salt lake lies. The old lake then overflowed northward at the lowest pass in the enclosing mountains and discharged to a branch of the Columbia river. The old shore lines may still be seen on the mountain sides, nearly 1000 feet above the level of Great Salt lake.

In what direction does the Humboldt river flow? This is one of the streams which run into sinks and form salt lakes. The first railroad built across the continent follows the Humboldt river past the ends of about fifteen ranges.

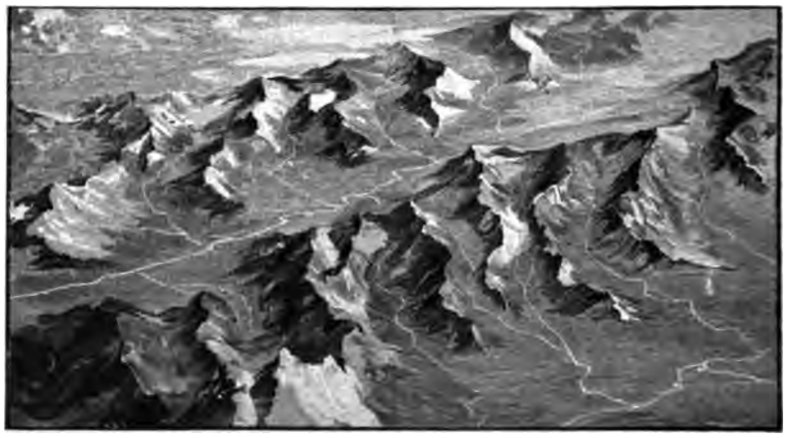
In the low southwest part of the Great Basin, there is a sink that dips below the level of the sea. This is known as *Death Valley* and is noted for its dryness and its intense summer heat. Still farther south lies the Mohave desert, stretching from the Sierra Nevada to the Colorado river.

Colorado Plateau Region (page 37).

A region extending northward from the gulf of California was once covered by that body of water, but was cut off by the delta of the Colorado river. The region being very dry, the water in the old head of the gulf has long since dried away, leaving a desert plain. Sometimes a distributary from the Colorado river flows into the hollow and forms a temporary lake.

The Basin region includes not only the Great Basin, but also two smaller districts that are partly drained to the sea. One of these is southeast, and the other northwest, of the Great Basin. On the map (*page 32*) they are separated from the rest of the Basin region by lightly-dotted lines.

In the northwest part of the Basin region, the mountains are so young that no deep valleys are yet worn in their sides. These mountains are edges of huge blocks, tilted like those shown in the picture. The shape of the blocks has hardly changed since the region was thus broken up. Lakes lie in the troughs between the tilted blocks. Most of the lakes have no overflow to the sea.



Basin Ranges and Troughs, — Wet Season.

## 38. The Colorado Plateaus.

A broad region southeast of the Great Basin consists of lofty plateaus in which rivers have cut long and deep canyons. This highland region is known as the *Colorado plateaus*.

The rainfall on the Colorado plateaus is light, because high ranges lie to windward, near the Pacific coast. The higher and cooler parts of the plateau receive the most rainfall. The largest rivers in this region are fed by rains and melting snow on the Rocky mountains.

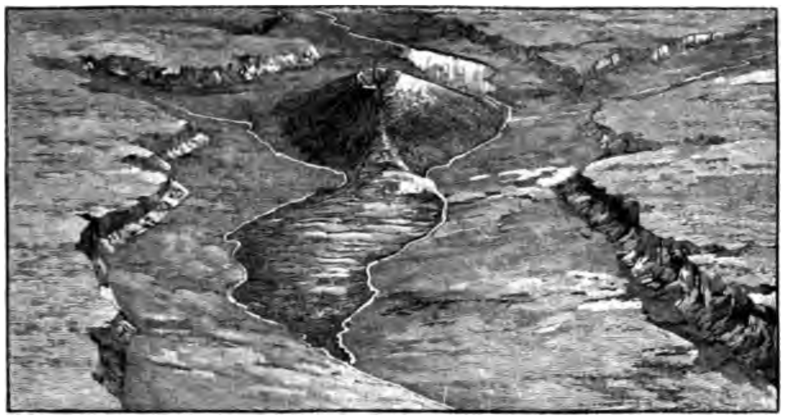
Canyon of the Colorado.

Lower Colorado.

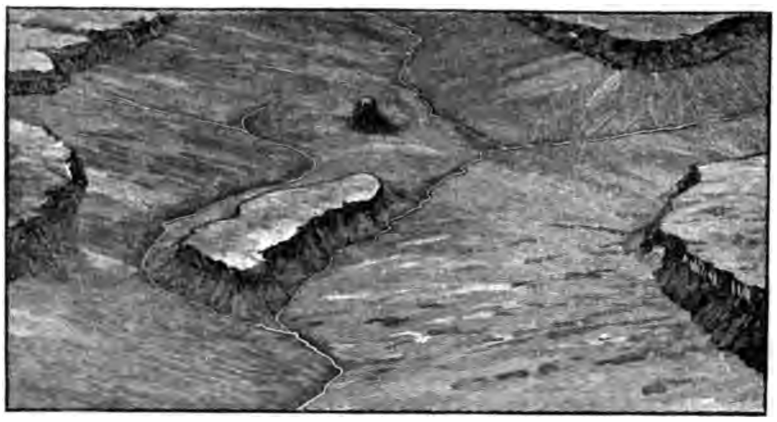
These plateaus were formed ages ago by the slow uplifting of great blocks of land, many miles long and wide. The surfaces of some of the blocks are a mile or a mile and a half above sea level.

The edges of the higher blocks form cliffs a thousand or more feet high. In many places the rocky layers rise one over another, in broad benches, as shown in a picture on the opposite page.

Across these plateau blocks, the Colorado river has cut a great canyon, with steep sides all rugged with spurs and ravines. There one may see the rocks, layer on layer, of which the plateaus are made.



Young Volcano.



Mesa and Volcanic Neck.

For a long distance the Colorado canyon is about a mile deep. Its sides consist of rocks of many colors, — gray, brown, red, yellow and purple. At times of sunrise and sunset, first one color and then another catches the light or is thrown into shadow, — making a marvelous display.

The Colorado canyon is a young river valley. Unlike most valleys, it does not serve as a place to live in or as a route of travel. The rapids in the river prevent navigation; the canyon is so deep and narrow that it can be followed only with great danger; and travel across it from cliff to cliff is almost impossible.

Several large volcanoes have been built on the Colorado plateaus, and many lava-flows have spread over their surfaces. Some of the volcanoes have wasted away, so that only the *necks* through which the lavas came are now to be seen. These necks form steep hills, or *buttes*.

Some of the lavas which flowed from the volcanoes to the lower land now form small table-lands, or *mesas*, — the surrounding surface having been worn away.

The Colorado plateaus are very thinly settled, for most parts of them are dry and barren, or covered with sage-brush. On several of the higher parts and near the streams there are groves and grassy tracts.

Ancient Cliff Dwellings.

On some of the mesas, tribes of Indians make their homes. The steep sides of the mesas afford protection from enemies.

Ruins of strange dwellings are found in shallow caves under the cliffs in some of the canyons of the Colorado plateau region. The Indians who made these dwellings disappeared before the white men set foot in that country. The people of that ancient race are now called "Cliff-dwellers." They knew how to weave coarse cloth and to make pottery. Their villages were built in the cliffs in order that the tribes might be safe from attack.

Many kinds of *cactus* plants thrive in this dry plateau country. Some of these are small, but others grow to trees.[1]

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[1] On the next page there are pictures of two species of cactus trees and also of a *tree yucca*, or *Spanish bayonet*. The latter has stiff bayonet-like leaves.

**Great Salt Lake, Utah.**

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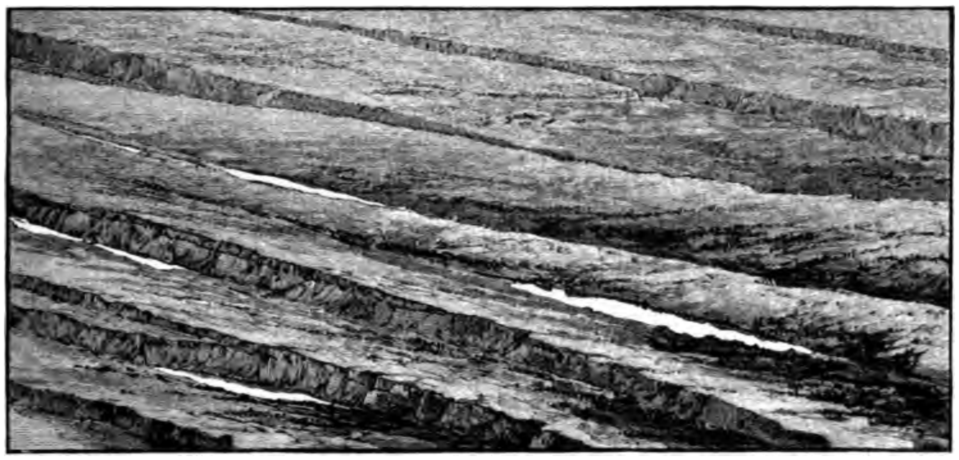


**Young Mountains or Tilted Blocks, — Northwest Part of Basin Region.**

Some of the deep-worn ranges in this region have rich mines of gold and of silver ore. These have led to the building of other small cities and towns, but the Basin region is only thinly settled.

The streams of this region, like nearly all other streams on the earth, wash salt from the soil. The salt is formed by the weathering of certain kinds of rocks. The amount of salt carried by a river during an entire season may be very small, but if the river flows for ages into a basin having no outlet, much salt gathers there. Water standing in such a basin forms a salt lake.

There are many salty valleys and salt lakes in the Great Basin. One of these, Great Salt lake, covers an area of about two thousand square miles. This lake widens in rainy weather and shrinks in time of drouth. A cupful of its water contains a tablespoonful of salt, — more than four times the quantity in a cupful of ocean water. Salt Lake City, the largest city in the Great Basin, is near the shore of this lake.

Many centuries ago, when there was a wetter climate, a much larger body of water filled the basin in which Great Salt lake lies. The old lake then overflowed northward at the lowest pass in the enclosing mountains and discharged to a branch of the Columbia river. The old shore lines may still be seen on the mountain sides, nearly 1000 feet above the level of Great Salt lake.

In what direction does the Humboldt river flow? This is one of the streams which run into sinks and form salt lakes. The first railroad built across the continent follows the Humboldt river past the ends of about fifteen ranges.

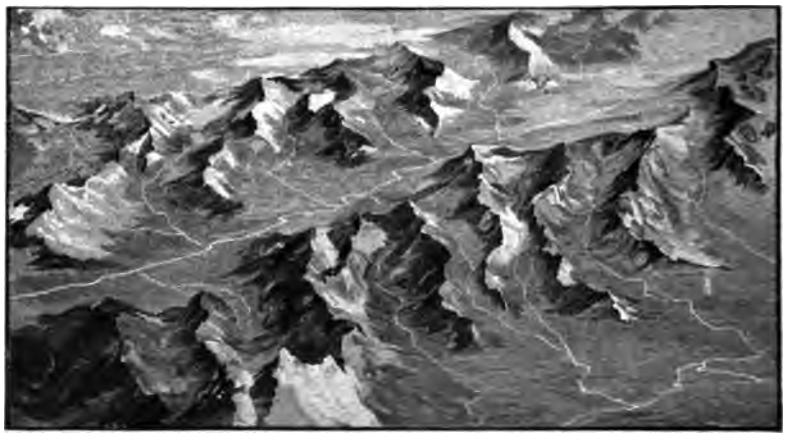
In the low southwest part of the Great Basin, there is a sink that dips below the level of the sea. This is known as *Death Valley* and is noted for its dryness and its intense summer heat. Still farther south lies the Mohave desert, stretching from the Sierra Nevada to the Colorado river.

**Colorado Plateau Region (page 37).**

A region extending northward from the gulf of California was once covered by that body of water, but was cut off by the delta of the Colorado river. The region being very dry, the water in the old head of the gulf has long since dried away, leaving a desert plain. Sometimes a distributary from the Colorado river flows into the hollow and forms a temporary lake.

The Basin region includes not only the Great Basin, but also two smaller districts that are partly drained to the sea. One of these is southeast, and the other northwest, of the Great Basin. On the map (*page 32*) they are separated from the rest of the Basin region by lightly-dotted lines.

In the northwest part of the Basin region, the mountains are so young that no deep valleys are yet worn in their sides. These mountains are edges of huge blocks, tilted like those shown in the picture. The shape of the blocks has hardly changed since the region was thus broken up. Lakes lie in the troughs between the tilted blocks. Most of the lakes have no overflow to the sea.

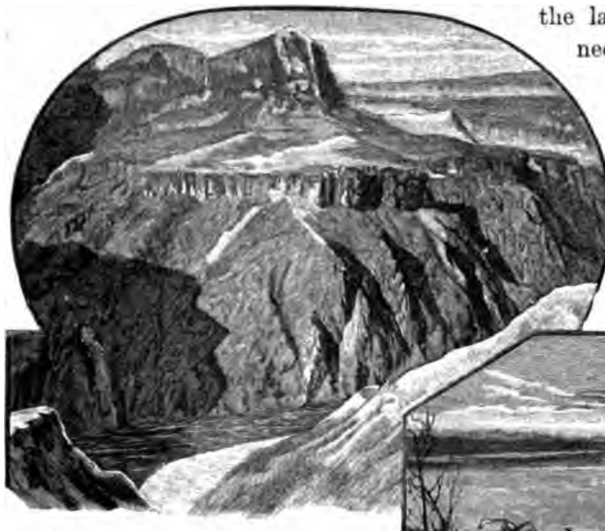


**Basin Ranges and Troughs, — Wet Season.**

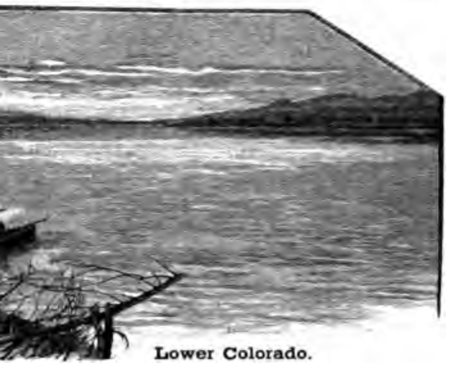
## 38. The Colorado Plateaus.

A broad region southeast of the Great Basin consists of lofty plateaus in which rivers have cut long and deep canyons. This highland region is known as the *Colorado plateaus*.

The rainfall on the Colorado plateaus is light, because high ranges lie to windward, near the Pacific coast. The higher and cooler parts of the plateau receive the most rainfall. The largest rivers in this region are fed by rains and melting snow on the Rocky mountains.



**Canyon of the Colorado.**

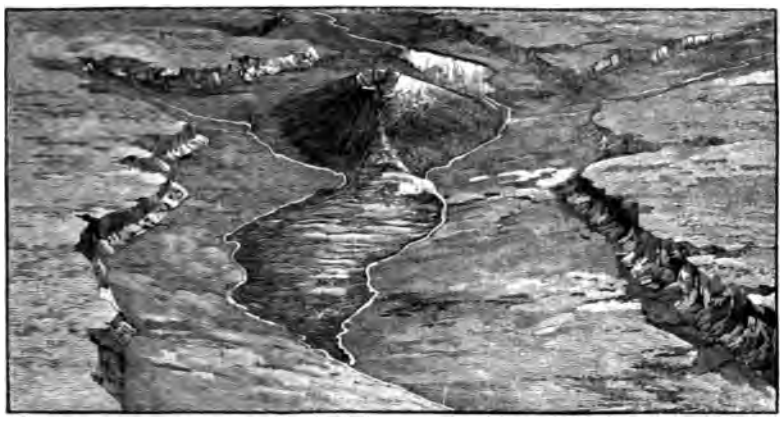


**Lower Colorado.**

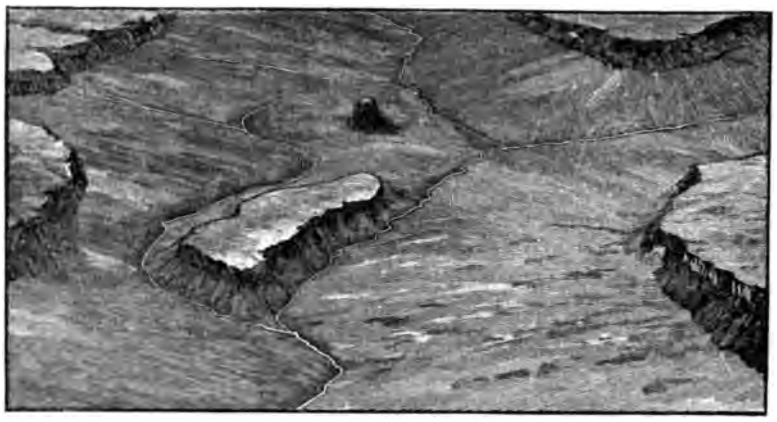
These plateaus were formed ages ago by the slow uplifting of great blocks of land, many miles long and wide. The surfaces of some of the blocks are a mile or a mile and a half above sea level.

The edges of the higher blocks form cliffs a thousand or more feet high. In many places the rocky layers rise one over another, in broad benches, as shown in a picture on the opposite page.

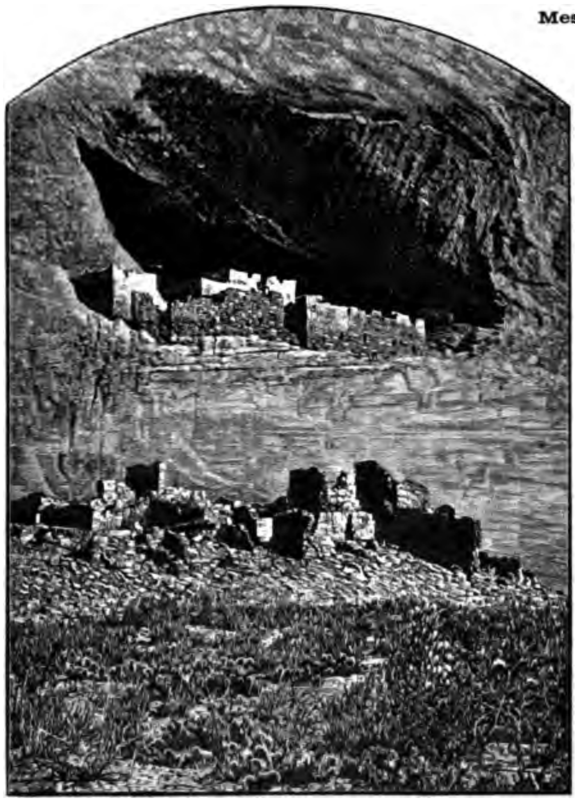
Across these plateau blocks, the Colorado river has cut a great canyon, with steep sides all rugged with spurs and ravines. There one may see the rocks, layer on layer, of which the plateaus are made.



**Young Volcano.**



**Mesa and Volcanic Neck.**



**Ancient Cliff Dwellings.**

For a long distance the Colorado canyon is about a mile deep. Its sides consist of rocks of many colors, — gray, brown, red, yellow and purple. At times of sunrise and sunset, first one color and then another catches the light or is thrown into shadow, — making a marvelous display.

The Colorado canyon is a young river valley. Unlike most valleys, it does not serve as a place to live in or as a route of travel. The rapids in the river prevent navigation; the canyon is so deep and narrow that it can be followed only with great danger; and travel across it from cliff to cliff is almost impossible.

Several large volcanoes have been built on the Colorado plateaus, and many lava-flows have spread over their surfaces. Some of the volcanoes have wasted away, so that only the *necks* through which the lavas came are now to be seen. These necks form steep hills, or *buttes*.

Some of the lavas which flowed from the volcanoes to the lower land now form small table-lands, or *mesas*, — the surrounding surface having been worn away.

The Colorado plateaus are very thinly settled, for most parts of them are dry and barren, or covered with sage-brush. On several of the higher parts and near the streams there are groves and grassy tracts.

On some of the mesas, tribes of Indians make their homes. The steep sides of the mesas afford protection from enemies.

Ruins of strange dwellings are found in shallow caves under the cliffs in some of the canyons of the Colorado plateau region. The Indians who made these dwellings disappeared before the white men set foot in that country. The people of that ancient race are now called "Cliff-dwellers." They knew how to weave coarse cloth and to make pottery. Their villages were built in the cliffs in order that the tribes might be safe from attack.

Many kinds of *cactus* plants thrive in this dry plateau country. Some of these are small, but others grow to trees.[1]

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[1] On the next page there are pictures of two species of cactus trees and also of a *tree yucca*, or *Spanish bayonet*. The latter has stiff bayonet-like leaves.

### 39. The Columbia Plateau.

**What large river drains the region on the north of the Great Basin? Name the largest south branch of this river.**

**What mountains are on the east and the west sides of the *Columbia plateau*. *See map on page 32.***

The Columbia plateau is about half as high as the Colorado plateau region. The north and east parts of the Columbia plateau are broken by rugged mountains. Great lava plains form the south and west parts. This plateau is in the path of the westerly winds, and receives more rainfall than the Great Basin, for the Cascade mountains are lower than the Sierra Nevada.

In the northeast portion of the Columbia plateau there are many fertile valleys. Some of these are wooded with pine and fir trees. Other parts have deep and rich soil which in recent years has yielded large crops of wheat.

The lava plains in the southwest are mostly dry and barren, except near the streams.

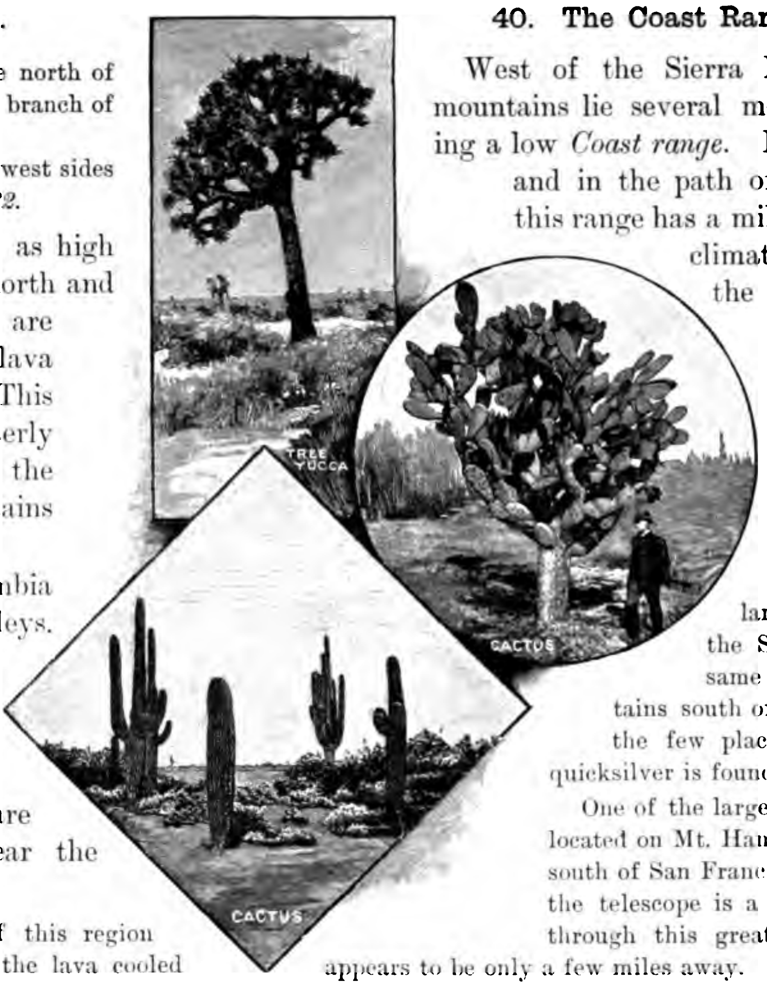
Long ages ago, the great lava-floods of this region were poured into a broad lowland where the lava cooled and formed an immense plain between high ranges on the east and the west. A picture on page 15 shows part of the lava plain, and one of the cuts on page 31 shows a cooled lava wave.

The lava plain of the Columbia region covers many thousand square miles,[1] and in places is hundreds of feet deep.

Ages have passed since the great flows of lava took place. Rivers have now worn canyons in the lava beds. The narrow flood plains are fertile and afford fine soil for the growth of wheat, but most of the region is barren and therefore thinly settled.

The Snake river has cut the longest and deepest of these canyons. Near the head of its canyon, the river plunges over the edges of some of the lava beds, making falls of great size and beauty. These are known as the *Shoshone falls*.

Along the sides of the canyon, both above and below the falls, can be seen the lava and ashes, layer on layer, through which the river has cut its channel.



### 40. The Coast Range and Valleys.

West of the Sierra Nevada and Cascade mountains lie several mountain ridges forming a low *Coast range*. Being near the ocean, and in the path of the westerly winds, this range has a milder and more uniform climate than the regions in the interior of the continent. Most parts of the range are wooded.

Near the foggy coast north of San Francisco bay grow the giant *redwood trees* which yield valuable lumber. The redwoods are almost as large as the "big trees" of the Sierra and belong in the same family. In the mountains south of the bay, there is one of the few places in the world where quicksilver is found.

One of the largest telescopes yet made is located on Mt. Hamilton, in the Coast range south of San Francisco. The object glass of the telescope is a yard in diameter. Seen through this great instrument, the moon appears to be only a few miles away.

The long lowland plain between the Sierra Nevada and the Coast range is called the *valley of California*. It is covered with waste washed from the mountains. This great valley has plentiful winter rains, but its summers are dry. Its principal products are wheat and fruit.

Many streams from the Sierra are still building up the floor of the valley plain with their flood deposits. The streams flow in shallow channels and are easily turned aside to irrigate the land.

The great port of San Francisco, on the fine bay of the same name, owes its rapid growth to the discovery of gold in the Sierra Nevada and to the wonderful fertility of the valley of California.

Orange Grove, California.

San Francisco bay is the drowned valley of a river that once cut through the mountains. It is the only break in the Coast range west of the Sierra Nevada, and forms one of the best harbors in the world. The streams which flow from the west slope of the Sierra run along the valley, then unite and enter San Franciso bay.

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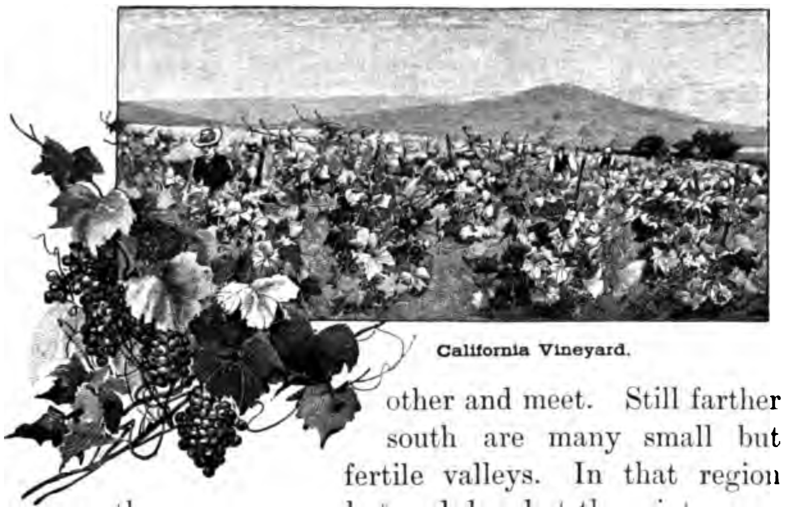
[1] The lava-flows in this part of the continent cover from 150,000 to 200,000 square miles, — an area equal to about one twentieth that of our whole country. Part of the lava-flows took place in Canada. They are the greatest in the world, except perhaps those of the Deccan peninsula, in India.

In the south the valley of California ends where the Coast range and the Sierra Nevada bend towards each other and meet. Still farther south are many small but fertile valleys. In that region the summers are hot and dry, but the winters are mild and rainy. During the dry season, water for the fruit groves is led in ditches from the mountains. Oranges, lemons, grapes, and many other kinds of fruit thrive in the valleys.


California Vineyard.

Owing to the mildness of the climate, the cities of southern California have become well known as health resorts.

Lick Observatory, Mt. Hamilton.

The Willamette valley lies between the Cascade and Coast ranges. This region is well watered and is very fertile. Portland has a fine harbor on the Willamette river and has therefore grown to be the leading center of trade in the region.

Sand bars form at the mouth of the Columbia and make entrance difficult for large vessels. Massive stone walls, called *jetties*, have been built to narrow the channel and thus deepen the mouth of this great stream. The Columbia river is famous for its salmon fisheries.

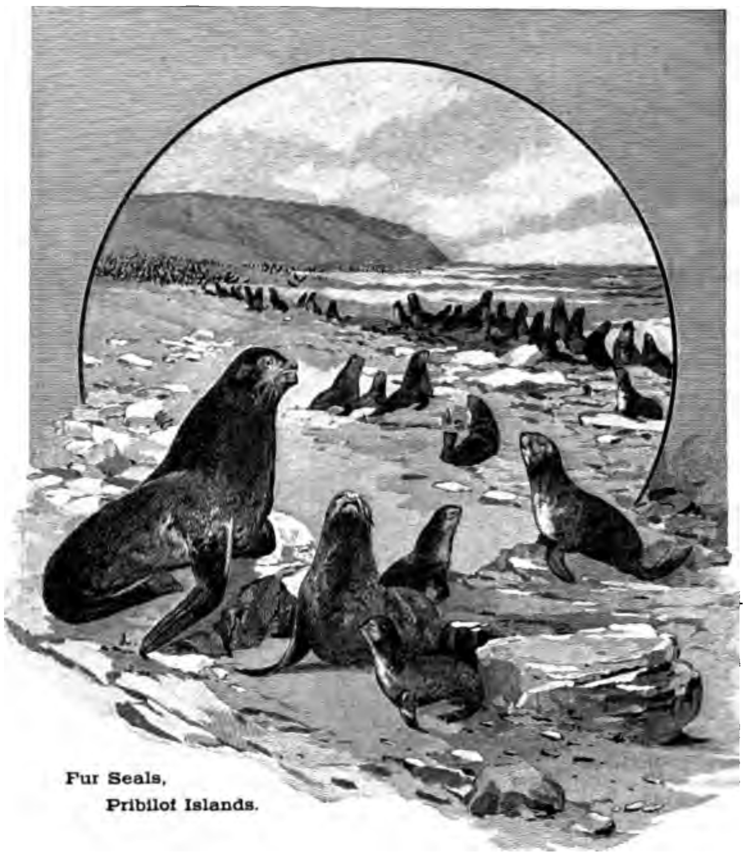
Where is Puget sound? What large island partly incloses this great sound? *See map of United States in the Supplement.*

San Francisco—Golden Gate.

Old Cliff House and Seal Rocks.

Puget sound is a drowned valley that leads sea-water through the Coast range and forms many fine harbors. The region about the sound is in the path of the westerly storm eddies and is one of the leading lumber districts in the world. Its mountain slopes are covered with pine, fir and spruce.

For a long distance northward from the head of Puget sound, the mountainous coast region is broken by deep valleys, now partly sunk beneath the sea. The drowned valleys form many *fiords* running far inland, and also long *sounds* behind islands. Puget sound is the most important of these drowned valleys. Steamers can follow the quiet waters of these sounds and thus avoid the rough ocean outside.


Fur Seals, Pribilof Islands.

Rivers bearing plentiful waste from the mountains have built deltas at the heads of many of the fiords, thus forming smooth-floored valleys only a little above sea level.

## 41. The Yukon Region.

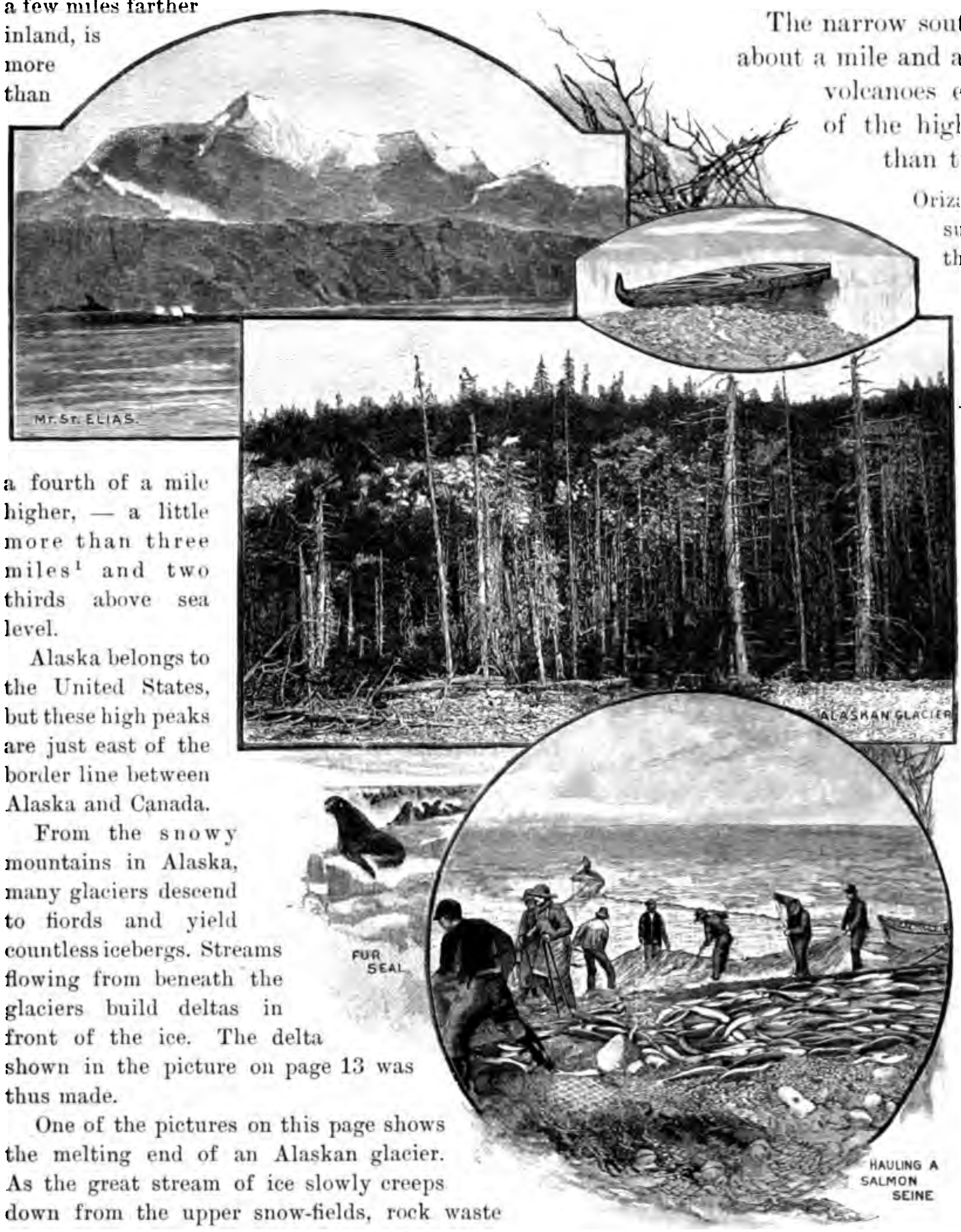
Northward from the Columbia region the country is mountainous but not very high nor very wide, except in the border ranges.

What mountains border this region on the east? What range is on the west?

In the far northwest, the ranges of the Rocky Mountain highland spread apart in the great peninsula of Alaska. The main range bends westward along the coast, to the end of the Alaskan peninsula.

The greater part of Alaska is drained by the Yukon river. This is one of the largest streams in America. Most of its basin is cold, dreary and little known.

The southwest shore of Alaska has a mild climate, although so far from the equator. The ocean winds are there warmed by the drift from the Japan current. Warm moist winds from the sea are chilled in rising over the mountain slopes in Alaska and therefore yield very heavy snowfall.



Among the high peaks of this region are Mt. Logan and Mt. St. Elias. For a long time Mt. St. Elias was thought to be the highest peak on the continent, but Mt. Logan, recently discovered a few miles farther inland, is more than a fourth of a mile higher, — a little more than three miles[1] and two thirds above sea level.

Alaska belongs to the United States, but these high peaks are just east of the border line between Alaska and Canada.

From the snowy mountains in Alaska, many glaciers descend to fiords and yield countless icebergs. Streams flowing from beneath the glaciers build deltas in front of the ice. The delta shown in the picture on page 13 was thus made.

One of the pictures on this page shows the melting end of an Alaskan glacier. As the great stream of ice slowly creeps down from the upper snow-fields, rock waste falls upon it, and near the lower end trees grow in the soil on the ice. In the picture, the face of the glacier looks like a cliff almost hidden by the trees in front of it and upon it.

The shore-waters and many of the streams of Alaska abound in fish. The people in this district prepare great quantities of salmon for market.

Where is Bering sea? In summer large herds of seals visit the Pribilof islands, in Bering sea, to rear their young. Many of these seals are killed for their fine fur. The islands on the south, partly inclosing this sea, contain many volcanoes now active.

What lands are separated by Bering strait?

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[1] Mt. Logan, 19,500 feet; Mt. St. Elias, 18,010 feet.

## 42. Highland of Mexico.

West of the gulf of Mexico rises the lofty highland of Mexico. This great mass of land is narrow in the south but broad in the north where it merges into the Basin region and the Rocky mountains.

The highest range of mountains running northward in Mexico is the Sierra Madre.

The narrow southern end of the *plateau* of Mexico is about a mile and a half above sea level. A chain of large volcanoes extends east and west across this end of the highland. Some of the craters are more than twice as high as the plateau.

Orizaba is the highest of these peaks, but its summit is more than a thousand feet lower than that of Mt. Logan.

Popocatepetl is another high peak in this volcanic region. Indians that live on the sides of Popocatepetl take sulphur in large quantities from the crater.

Northward from this chain of volcanoes stretches the lofty plateau. Below it, on the east, lie narrow marshy coastal plains. The region west of the Sierra Madre resembles the Basin region of our country.

Mexico lies north of the equatorial rain belt but is in the track of the trade winds. The wet season on the plateau and in the eastern coastal plain prevails in summer when the moist air from over the sea blows inland. Most of the western slope of the highland of Mexico is dry, because the winds that blow over it are warming on their way towards the heat equator. The region is too far north to be reached by the equatorial rains and too far south for the moist westerly winds. *See maps on page 24.*

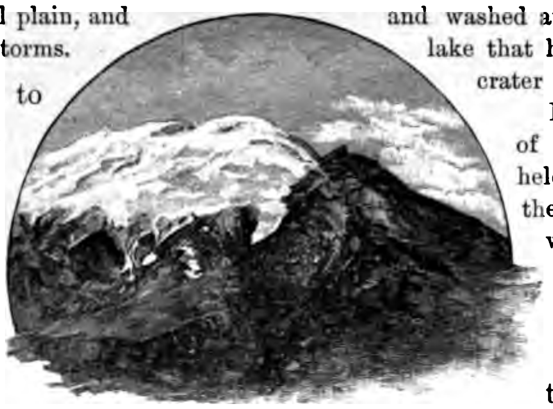
The highland of Mexico is so near the coasts that there are no large river basins on either side. In times of heavy rainfall, many small streams on the east slope rush down gorges that they are wearing in the side of the plateau, and overflow parts of the narrow coastal plain.

Several low ranges divide the high plain into shallow troughs like those in the Great Basin. The rainfall is so light that from most of the basins there is no overflow to the sea, and therefore no deep canyons have been cut in these parts of the plateau. In rainy seasons water collects in the basins and forms lakes. When the rains are over, the water in many of the lakes dries away.

The eastern coastal plains of Mexico are hot and unhealthful. They consist largely of swampy land, densely wooded.

There are no good harbors, because there are no drowned valleys nor large river mouths. The gulf coast of Mexico is fringed with long sand bars built offshore by the waves. Vera

Cruz, the chief port, is on the narrow coastal plain, and sand bars partly protect the harbor from storms.



Popocatepetl, Mexico.

Because of height and nearness to the equator, the climate of the plateau of Mexico is mild all the year, and there are no long periods of great heat or cold. This plateau produces oaks, cedars and other trees, as well as many smaller plants like those in the southwest part of our country.

Millions of Indians and white people live on the plateau of Mexico. The chief city is called *Mexico*. It is situated in a beautiful hill-encircled valley nearly a mile and a half above sea level.

Mexican Cart.

## 43. Central America.

Which part of North America is called *Central America?*

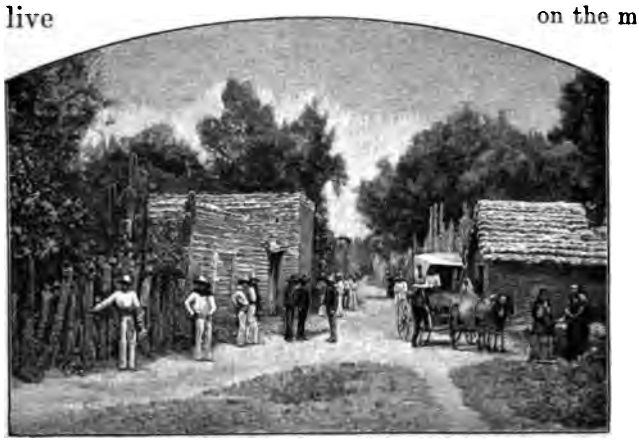
Most of this region is rugged country. Its highest parts are volcanic ranges rising mainly along the Pacific border, but branching inland. These ranges are not nearly so high as the great volcanic range in Mexico. The Pacific coast of this region is bold and rocky.

Water Carrier, Mexico.

Central America is in the belt of the trade winds and receives rains chiefly on the east slope. In summer this land has also the equatorial rains which water the west as well as the east coast.

The eastern coastal plain of Central America is a continuation of that in Mexico. These damp lands are densely wooded and are covered with jungles in which many wild beasts live. Plants grow so quickly there that it is difficult to keep the lands cleared for farming.

Among the ranges of Central America are broad plains, or upland valleys, that average about half a mile in height. The soil of these plains consists mainly of weathered volcanic ash, very fine and fertile. Many white people, Indians and Negroes live in these upland valleys.



Mexican Village.

Locate Lake Nicaragua. This lake is part of a route that has been selected for a canal between the two oceans.

On an island in the lake there is a volcano whose sides were at one time laid out in beautiful gardens. Not many years ago, great streams of lava and ashes burst from the crater and flowed down the sides of the cone, burying the gardens many feet deep.

Another volcano in Central America poured a flood of water over a town and washed away its houses. The water came from a lake that had formed in the crater. There are many crater lakes in this region.

In many parts of Central America are ruins of temples and idols made by Indians who held the land when the white men first went there. Most of the ruins are now overgrown with trees.

## 44. The Appalachian Highland.

East of the Rocky mountains spreads the great central plain of North America. This plain reaches from the Gulf of Mexico to the Arctic ocean.

The *Appalachian highland* is east of the southern half of the central plain. This highland extends southwest from the gulf of St. Lawrence nearly to the gulf of Mexico.

The Appalachian highland is well supplied with rainfall at all seasons. Moist winds reach it from over the gulf of Mexico and the Atlantic ocean. The slopes of the highland are wooded with oak, maple, cone-bearers and many other kinds of trees.

Century Plants, Mexico.

The Appalachian highland consists of several regions which may be named as follows:

The *Old Appalachian range*, — including the New England highland, the Blue ridge, the Carolina highland, and other ridges having various names.

The *Piedmont Belt*. The word *piedmont* means *foot of the mountains*, and is here applied to the rolling or hilly land along the eastern foot of the Old Appalachian range.

The *Great Valley*, — a long and narrow lowland on the west of the Old Appalachian range.

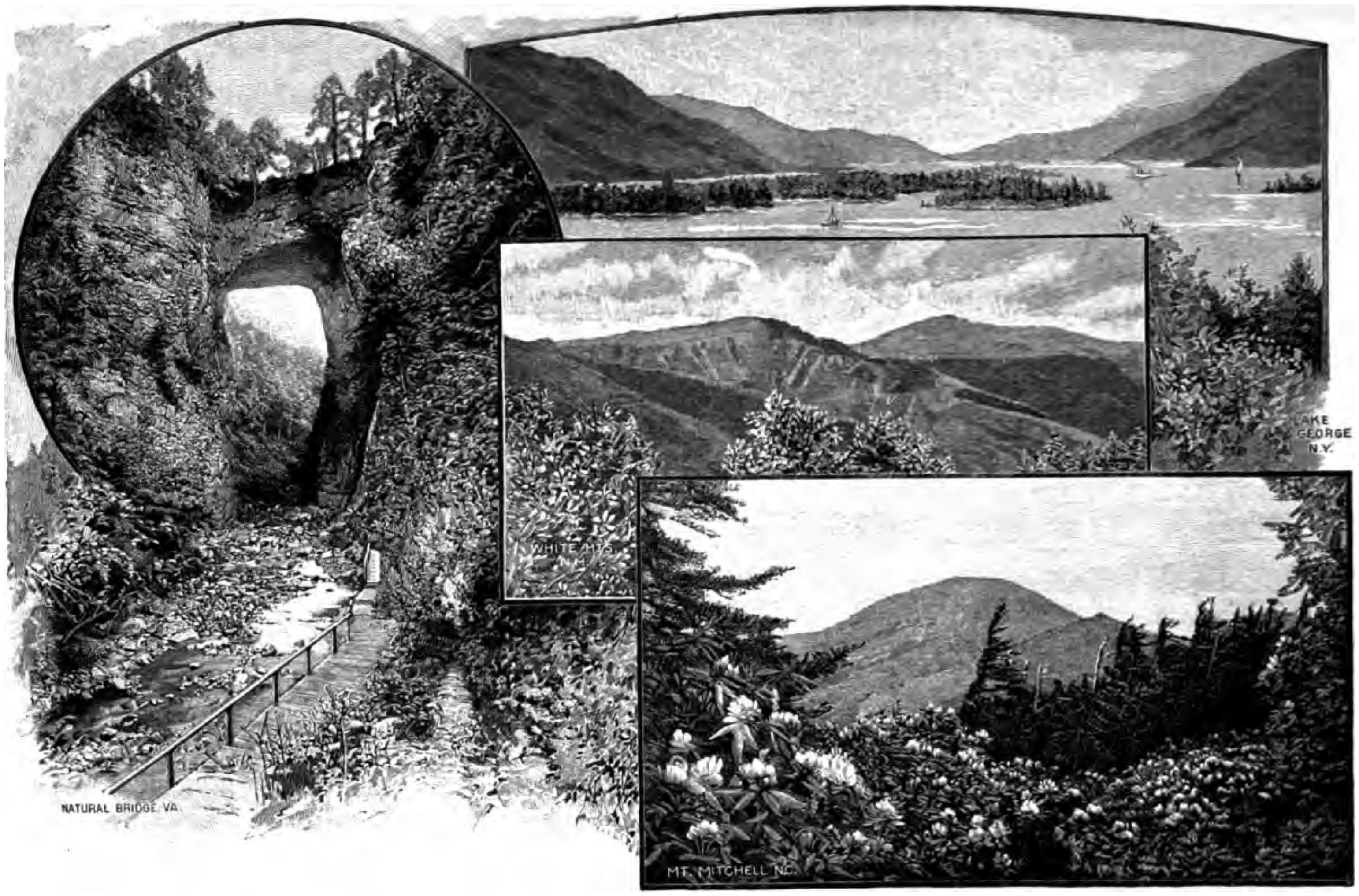
The *Alleghany ridges*, — rising on the west of the Great Valley.

The *Alleghany plateau*, — a broad upland region next on the northwest.

The boundaries of these regions are shown by lightly-dotted lines on the map. *See page 32.*

Note: The large island of Newfoundland, though beyond the gulf of St. Lawrence, may be treated as part of the Appalachian highland. This island has sunk partly beneath the sea, making a very broken coastline. In the ocean southeast of the island are shallow places known as the *banks* of Newfoundland. These banks abound in cod, halibut and other kinds of fish.

The ridges of the *Ozark highland* resemble the Alleghany ridges. *See lesson 47.*


NATURAL BRIDGE, VA.
LAKE GEORGE N.Y.
WHITE MTS. N.H.
MT. MITCHELL, N.C.

### 45. Old Appalachian Range and Piedmont Belt.

The portion of the Old Appalachian range known as the *New England highland* stretches from the gulf of St. Lawrence to the Hudson river.[1] This highland consists of a broad and rolling upland, above which rise hills and mountains. The surface is also broken by many valleys in which lakes abound.

The highest group of peaks in this highland is known as the *White mountains*. The Connecticut valley, with its fine farming lands, lies between this group and the *Green mountains*.

MT. MANSFIELD, GREEN MTS.

Mt. Washington, one of the White mountains, is the highest peak in the northeast part of our country.

The rolling or hilly *piedmont* slope of the New England highland reaches to the sea. The cities and towns of this region are nearly all on the seacoast or near the falls in the rivers. Boston is the greatest seaport in this region.

The surface of the New England highland was heavily scoured by the ancient ice-sheet from the Laurentian highland. The weaker rocks were worn away, and rock waste was left unevenly spread over the region. When the ice melted, the streams were held back in the scoured basins and behind the barriers of drift, or rock waste, thus forming numerous lakes. Many of the streams were pushed aside from their old valleys and were made to flow over ledges from which they now fall in rapids and cascades. Since the ice melted, there has not been time for the streams to cut down the ledges and drain the lakes. Towns and cities have grown up at the falls and rapids where water power is supplied to many mills and factories. The coastline of this piedmont slope is very irregular, for the land has sunk partly beneath the sea, forming deep bays or fiords which separate headlands and islands. Waves

OLD MOUNTAIN LOW LAND, N. J.

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[1] The New England *states* occupy only part of this highland.

**on the exposed shores are cutting cliffs[1] but the rocks are so hard that they wear away very slowly.**

For some distance southwest of the Hudson river, the Old Appalachian range is neither so high nor so wide as in the New England highland. This lower part looks like a long and narrow plateau. Still farther southwest, the old range becomes higher and wider and is there called the *Blue ridge*.

On the south, the Blue ridge runs into the Carolina highland which contains the highest peaks in the whole range.

**Mt. Mitchell, one of the Black mountains in the Carolina highland, is about a mile and a fourth high and overtops all other peaks in the Appalachian highland.**

Hudson Gorge, West Point.

A Cypress Swamp.

The piedmont slope east of the Blue ridge and Carolina highland is a hilly region gradually descending to the wide coastal plain, with its farm lands, its pine forests and its cypress swamps. This part of the piedmont is a fine farming district and is noted for its large crops of cotton and tobacco.

### 46. The Great Valley and Alleghany Ridges.

The Great Valley in the Appalachian highland is a long lowland, with mountains on the east and the west. At the north, the Great Valley opens into the St. Lawrence basin; and at the south, into the Gulf coastal plain. The greater part of the long valley is covered with farms.

**The largest rivers rising in the Appalachian region do not run *along* the Great Valley but *across* it, and escape by deep and narrow gorges worn through the inclosing highland. The Hudson, Delaware, Susquehanna, Potomac and James rivers rise in the highland *west* of the Great Valley and flow across the valley and the Old Appalachian range. *See colored map of Middle Atlantic states.***

**The Tennessee river rises in the old range *east* of the long valley, but flows westward across the valley and reaches the Ohio river.**

New York and Brooklyn.

Erie Canal.

The most important of these cross-gorges in the Appalachian range is that of the Hudson river, for it unites with other valleys to make an open highway northward to the St. Lawrence basin and westward up the Mohawk river towards the Great Lakes. Northward the valley route leads through Lake George and Lake Champlain.

A large part of the Hudson gorge has been slightly drowned, making a fine water way far inland from the seacoast.

Nearly three fourths of a century ago, the long *Erie canal* was built along the Mohawk branch of the Great Valley, from Lake Erie to the Hudson river. This canal furnishes a cheap route of trade between the Great Lakes and the Atlantic seacoast. Railroads now follow closely along the same route. The great port of New York owes its growth largely to its position on an excellent harbor at the mouth of the Hudson valley, where trade can easily be carried on, both inland and across the oceans. The other gorges which cross the highland are also used as lines of travel.

**Water slowly dissolves limestone and thus forms caves or caverns. There are many of these in the Appalachian region. The Cavern of Luray, in the Great Valley of Virginia, is one of the most beautiful.[2] *See picture on page 44.***

**The roofs of caves sometimes fall, making deep gorges; or only a small part may remain standing in the form of an arch. The Natural Bridge shown in the picture on page 42 is in the Great Valley. This rocky arch is over 200 feet high. *See colored map of Middle Atlantic states.***

The long even-crested ridges or folds west of the Great Valley, as far north as the Hudson gorge, may be called the

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[1] See pictures of Grand Manan, page 16.

[2] *Mammoth Cave*, Kentucky, is larger than that of Luray.

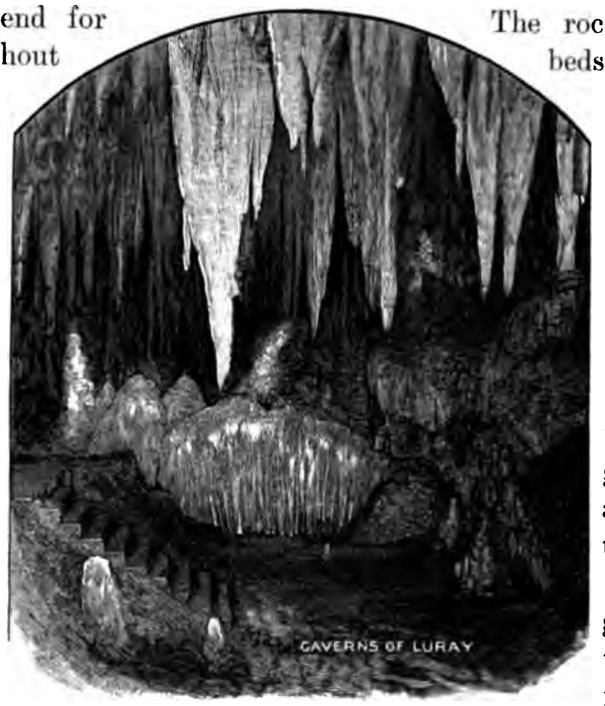
*Alleghany ridges.* They often extend for many miles in a straight course, without any peaks. *See note to picture below.*

These ridges are all forested, and the valleys between them are good farming lowlands. The streams which gather in these inner valleys escape through narrow notches, or *gaps*, in the ridges. The chief railroads and wagon roads enter the inner valleys through these gaps.

The northern part of the Alleghany ridges supplies almost all the hard coal and some of the iron ore used in our country.

### 47. The Alleghany Plateau.

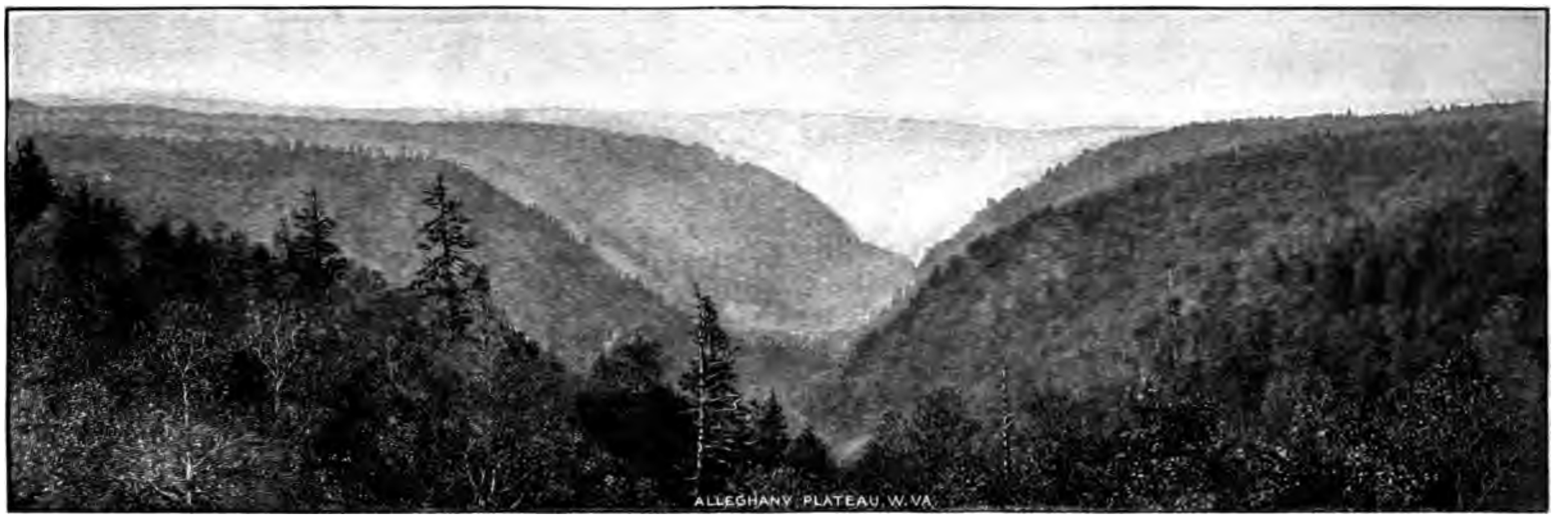
The eastern side of the Alleghany plateau falls by steep slopes into valleys next to the Alleghany ridges. On the west and south, the plateau descends gradually to the prairies and the Gulf coastal plain.



The rocky layers of the plateau contain beds of soft coal and iron ore. The many valleys cut by branch streams expose these valuable beds on the slopes, so that they can be easily found and mined. The northern half of the plateau yields great quantities of petroleum and natural gas.

Pittsburg has grown up at the place where two rivers unite to form the Ohio. This city is noted for its coal trade, iron mills and glassworks. The Ohio river forms a fine water way from Pittsburg to the Mississippi river.

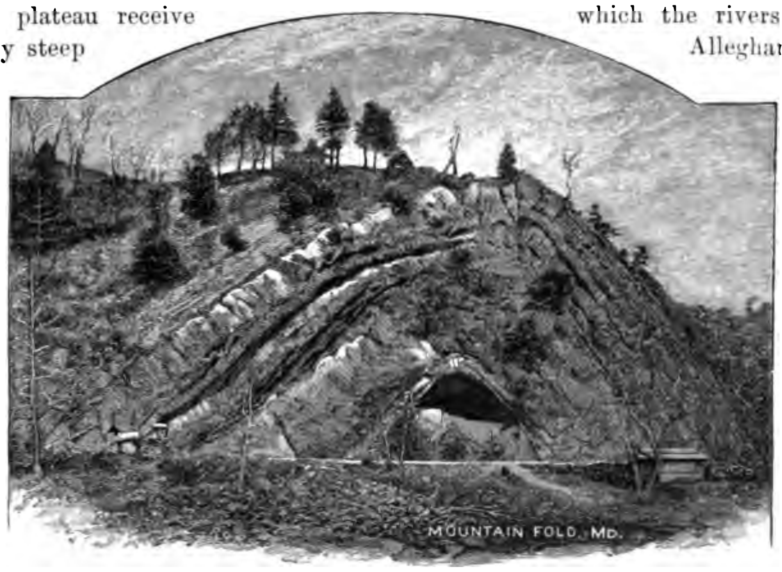
The southern half of the Alleghany plateau is mostly drained by two large tributaries of the Ohio river. These streams and their branches have worn deep valleys, making a very rugged region. Travel is difficult and this part of the plateau is not so thickly settled as that farther north.



This plateau is so greatly worn by branching streams that it is known to be older than the smoother plateau of the Columbia basin, where the valleys are narrower.

The rivers of the Alleghany plateau receive water so quickly from the many steep valley-slopes that they often rise thirty or forty feet in floods. Nearly all these rivers flow into the Ohio.

Most of the higher parts of the Alleghany plateau are forested and yield valuable timber. The lower western portions of the upland have been cleared of trees and now form rich farming and grazing districts, — famous for wool and for dairy products.



The Ozark highland, west of the Mississippi river, resembles parts of the Appalachian highland. The southern part of the Ozark region has many straight and even-crested ridges through which the rivers have cut gaps like those in the Alleghany ridges.

The northern half of the Ozark highland is a plateau whose main slope is towards the Missouri river. This plateau is greatly worn by streams and in form resembles the Alleghany plateau; but many of the even uplands in the Ozark region are open prairies.

Note: This picture shows part of one of the Alleghany ridges. The folded rock-layers were once covered by many others, but they have long been exposed to the weather and have therefore wasted away.

## 48. The Laurentian Highland.

The St. Lawrence river flows in a valley that separates the Laurentian highland from the Appalachian.

The Laurentian highland extends from the Labrador peninsula southwest towards the Great Lakes; thence running north of these bodies of water, the highland bends to the northwest and approaches the Arctic coast not far from the west shore of Hudson bay.

Northwest of the St. Lawrence gulf and river the highland is a desolate region strewn with boulders and broken by valleys. Bare rocky hills rise in some places, but no part deserves the name of mountain range.

This region was once more mountainous than it now is, but ages ago it was worn down. It is not so rich in valuable minerals as many old deep-worn mountains are.

The northeast part of our continent has sunk partly beneath the sea, making the coast line very irregular. The St. Lawrence valley was thus partly drowned, forming a broad gulf and carrying the navigable waters far inland.

In the valleys of the low plateau are many lakes and swamps through which streams flow. Near these grow thick forests that make traveling very difficult. The people travel mostly in canoes through lakes and streams, thus avoiding the swamps and forests.

The winter winds which reach the peninsula of Labrador, from over the northern lands, are cold and piercing. The winds which blow over it from the sea are always chilly, for a cold polar current sweeps past this part of the Atlantic coast.

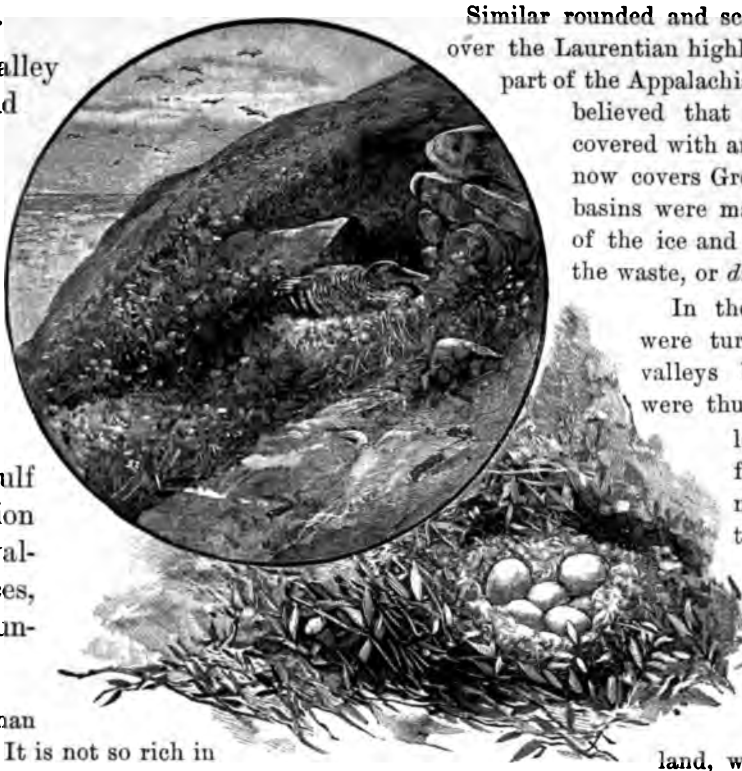
Many fur-bearing animals are found in this desolate region. Among these are beavers, foxes, martens and muskrats. Two species of large deer, the moose and the caribou, graze on mosses and tender shoots of trees in this cold country. *See pictures on page 50.* Ducks, geese and other seafowl abound along the rocky shores.

As the winters are severe, the rocky uplands rugged and the valleys swampy, the old highland is thinly settled. The few thousand Indians and still fewer white people who make their homes in that cold country live by hunting.

South and west of Hudson bay, the highland rises but little above the neighboring plains.

Far to the north and northeast of the Laurentian highland are many large islands. Ages ago these were probably part of the continent and were afterwards separated from it by the sinking of the land. The largest of these islands is Greenland. What have you read about the great ice-sheet of Greenland?

The creeping ice scrapes away the rock waste beneath, and rubs the rocks round and smooth,—scratching them with stones and sand that are dragged along. *See picture of rounded rocks, page 10.*



Elder Duck and Nest.

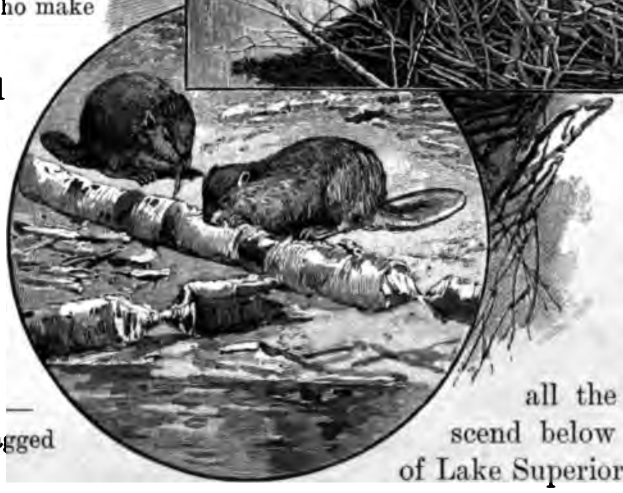
Similar rounded and scratched rocks are found all over the Laurentian highland and over the northern part of the Appalachian highland. It is therefore believed that these regions were once covered with an ice-sheet like that which now covers Greenland. Their many lake basins were made chiefly by the scraping of the ice and by the uneven heaping of the waste, or *drift*, which the ice left.

In these regions many streams were turned aside from their old valleys by barriers of drift, and were thus made to flow over rocky ledges where we now find falls and rapids. If it had not been for this action of the ice-sheet, there would be no lakes and but few falls in countries as old as the Laurentian or the New England highland. In the southern part of the Appalachian highland, where ice has not worked, there are no lakes, and falls are rare on the larger rivers. The streams there have had time to deepen their channels and thus drain the ancient lakes.

## 49. The St. Lawrence Basin.

The Great Lakes fill hollows on the southward slope from the Laurentian highland. These lakes and the St. Lawrence river, with all the streams flowing into them, form the St. Lawrence system.

The basins of the Great Lakes were deepened, though not wholly formed, by the rubbing or scouring of the ancient ice-sheet which moved across them from the Laurentian highland.



Work of Beavers.

No long slopes send large rivers to the Great Lakes. Much of their water supply comes directly from rain and snow. The bottoms of all the lakes, except Erie, descend below sea level. The surface of Lake Superior is about an eighth of a mile higher than the mouth of the St. Lawrence. The outlet of this lake is known as St. Marys strait. It is not navigable, because it descends in rapids to the level of Lake Huron.

Lock in the "Soo" Canal.

Rapids in St. Marys Strait.

The so-called *St. Marys strait* is a river about sixty miles long. Which picture shows the rapids in this river? Vessels avoid these rapids by going through the "Soo" canal. One of the pictures shows a steamer ready to come from the canal lock.

There are no rapids to prevent vessels from sailing between lakes Michigan, Huron and Erie, but between lakes Erie and Ontario there is an abrupt descent of the upland country, in a low bluff.

Niagara river, the outlet of Lake Erie, originally fell over the northern edge of this upland, thus forming the falls of Niagara. Since then the river has slowly cut a deep gorge back into the bluff, — the falls always keeping at the head of the gorge. They are now about six miles back from the edge of the bluff.

The falls of Niagara are about three fourths of a mile wide and one hundred and fifty feet high. Below the falls, the river rushes through its long gorge, making rapids of great size and grandeur.

Niagara Falls.

The cliffs of Niagara consist of layers of limestone on softer rock. From time to time, as the lower rock is worn away, huge masses of limestone break off and fall into the gorge. The stream must have worked thousands of years to cut this great valley, yet that time is short compared with the period during which the Hudson river was cutting its long gorge.

A large water way, known as the Welland canal, has been made to join lakes Erie and Ontario.

From Lake Ontario the St. Lawrence river forms a water way to the sea. The river has rapids, but canals have been built past them. Going down the stream, many steamers pass over the rapids. The city of Montreal is below the lowest rapids, near the head of the drowned part of the valley. That city marks the limit of navigation for ocean steamers on the St. Lawrence river.

Where is Lake Champlain? Into what river does its outlet flow? What group of mountains is west of this lake?

Niagara Gorge.

The rocks of the Adirondack mountains and of the highland south and west of Lake Superior are like those in the Laurentian highland. They are roots of old worn-down mountain ranges, and the land surface which long ago was high above the mineral layers is now brought down close to them. Both these small highlands yield large quantities of iron ore. The rocks of the old region south of Lake Superior contain not only the richest known deposits of iron ore, but also much copper.

The lightly-dotted line shown a little south of Lake Superior on the map, page 32, marks off a district that is drained by streams of the Mississippi system, yet the district is part of the old deep-worn highland described above. A lightly-dotted line has also been placed round the Adirondack highland, yet parts of it belong to the Hudson and St. Lawrence basins.

The slopes around the upper three Great Lakes form the leading lumber district in our country. The forests yield both hard and soft woods, such as are used in making furniture and in building houses.

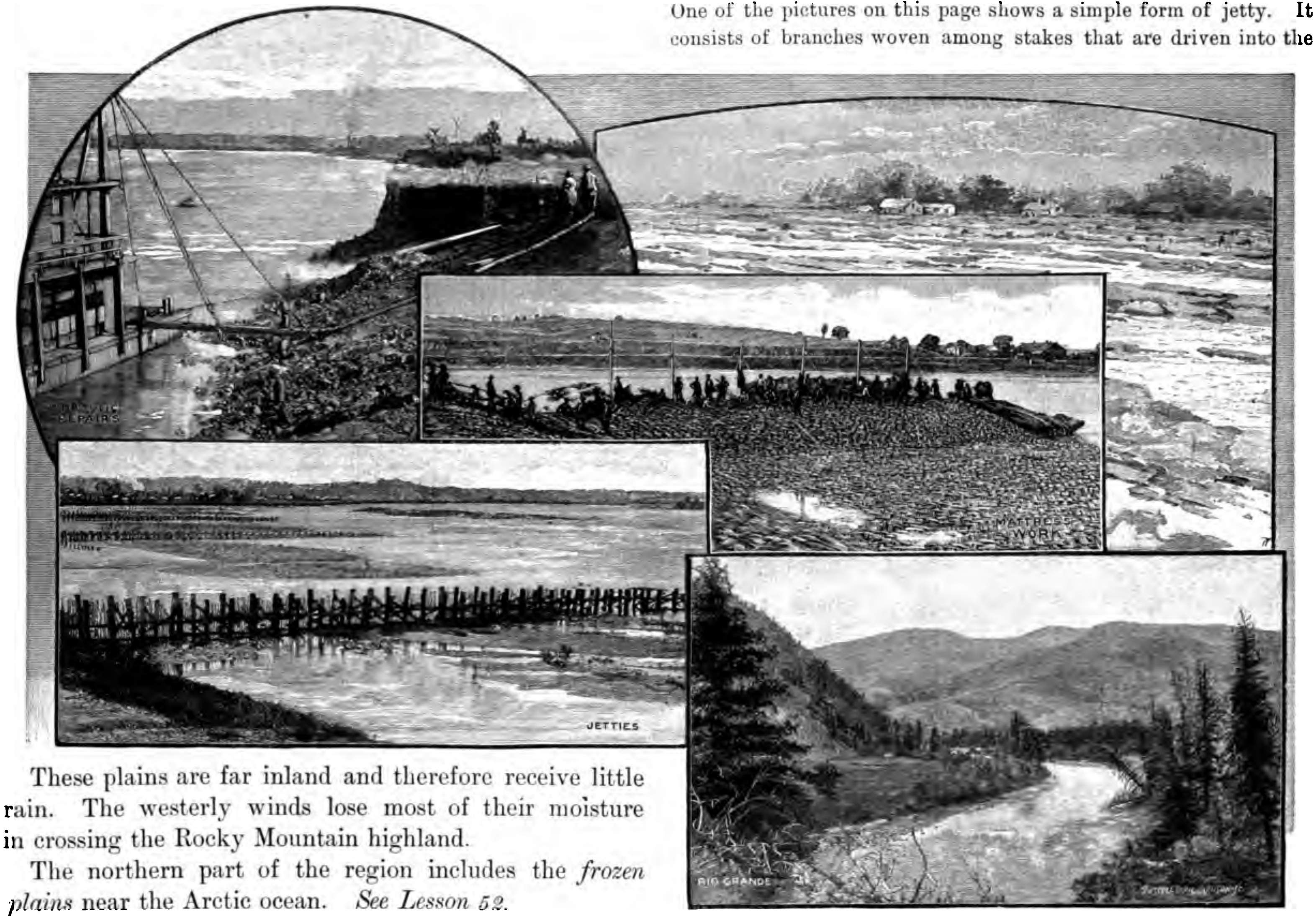
The St. Lawrence system is the best inland water way in the world. Hundreds of large steamers and other vessels help carry on trade between the lake ports and bear away many of the products of the mines, the farms, the forests and the workshops.

The largest of all these ports is Chicago. This city has grown very rapidly, because it is within easy reach of forests around the upper lakes, of farms and pasture lands in the central plain, of iron mines near Lake Superior, and of coal fields in the plain on the south.

Locate Buffalo, Cleveland, Detroit and Milwaukee. These lake ports are smaller than Chicago, but they resemble it in their trade.

### 50. The Western Plains.

Except in the far north, the part of the great central plain lying next east of the Rocky mountains has a long gradual slope eastward



These plains are far inland and therefore receive little rain. The westerly winds lose most of their moisture in crossing the Rocky Mountain highland.

The northern part of the region includes the *frozen plains* near the Arctic ocean. *See Lesson 52.*

South of the frozen portion are the *wooded plains* in Canada. The rainfall there is not heavy, but it has time to sink into the soil, for the hot season is short and the cold ground dries slowly. Snow lies in the forests for several months each year. Large streams flow eastward from this region.

In our own country, south of the wooded plains, lie the dry *Western plains*. Parts of these plains, near the mountains, are more than a mile above sea level.

From the Rocky mountains many large rivers flow eastward across the dry plains. These streams run swiftly down their sandy valleys and carry an immense quantity of land waste. Dry upland plains stretch from one valley to another. Most of these uplands are gently rolling. In some places, bench lands rise high above the general level of the country.

Describe the course of the Missouri river. This stream from its mountain source to the gulf of Mexico is thought to be the longest on the earth. The name of the stream is often written *Missouri-Mississippi*, because the Missouri joins the Mississippi long before the latter reaches the gulf of Mexico. Describe the course of the Arkansas river.

Large rivers like the Missouri and the Mississippi often do much damage when flooded. They sometimes cut into their banks, — destroying fields and washing away railroads.

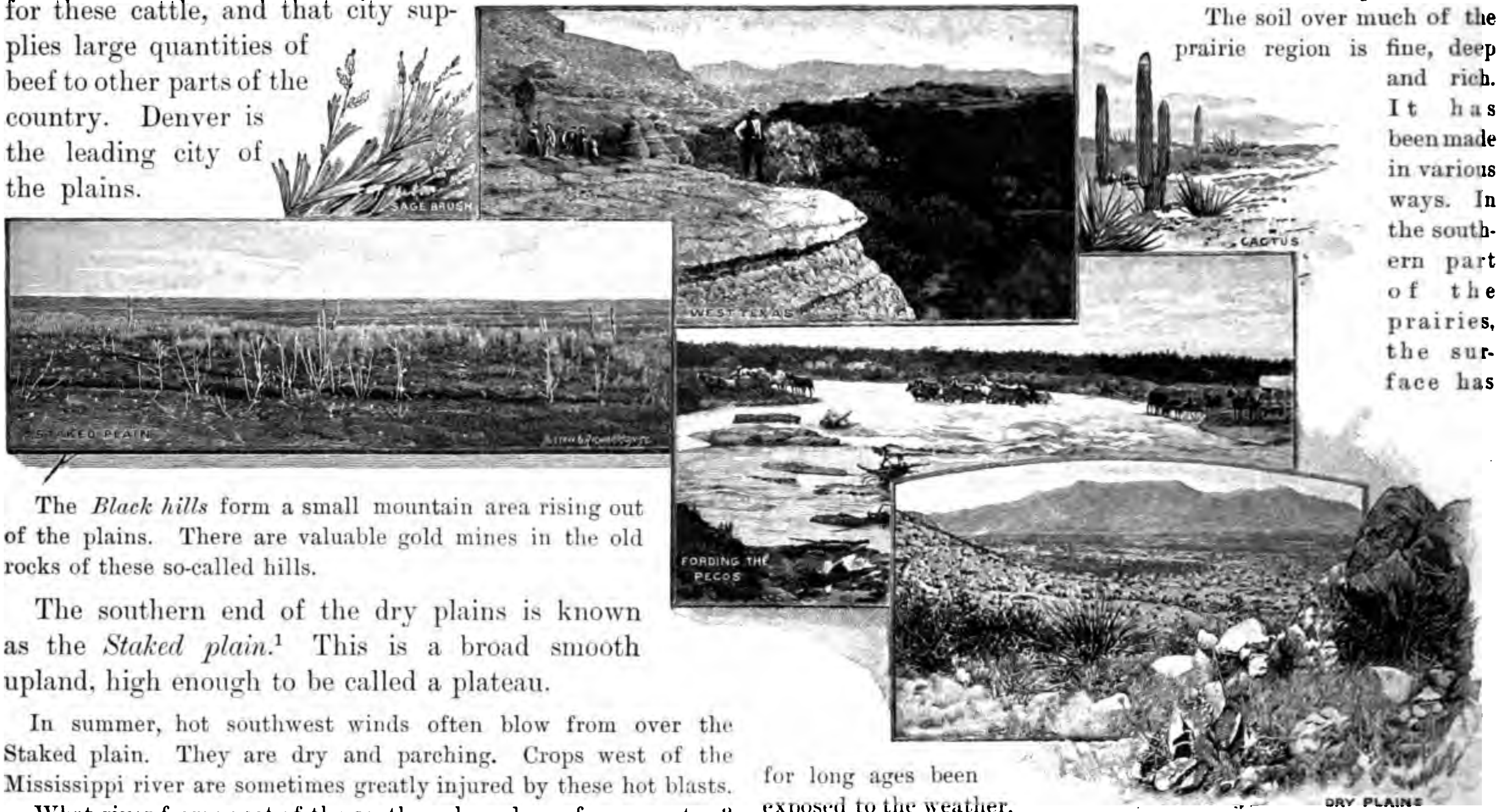
Jetties are built in some places to protect the river banks. One of the pictures on this page shows a simple form of jetty. It consists of branches woven among stakes that are driven into the river bed. The jetties not only prevent the swift currents from striking the bank, but they also cause the muddy water to eddy into still places between them and there deposit mud or sand.

Some river banks are protected by interwoven branches, making mattress work like that shown in the picture. Powerful force pumps are first used to slope the banks. Then the mattress is made and sunk, - reaching from flood level far down upon the river bed. Swift currents cannot cut through the mattress work till it is worn out.

The dry plains are not a desert, nor are they fertile. Sagebrush thrives in many places, and scanty grass grows almost everywhere. The best lands are in the large river valleys, or near the mountains where many small streams flow. There are good farms where canals and ditches have been made to turn aside river-water over the land.

**Many attempts have been made to get water from wells to irrigate the dry plains, but the supply of ground water is so small that a great part of the plains cannot be irrigated.**

Large herds of cattle graze on the western plains. Kansas City, Kansas, has grown to be a leading market for these cattle, and that city supplies large quantities of beef to other parts of the country. Denver is the leading city of the plains.



The *Black hills* form a small mountain area rising out of the plains. There are valuable gold mines in the old rocks of these so-called hills.

The southern end of the dry plains is known as the *Staked plain.*[1] This is a broad smooth upland, high enough to be called a plateau.

In summer, hot southwest winds often blow from over the Staked plain. They are dry and parching. Crops west of the Mississippi river are sometimes greatly injured by these hot blasts.

What river forms part of the southern boundary of our country?

The Western plains are thinly settled, because so little of the land receives water enough to make it productive.

### 51. The Prairies.

The lowlands in the upper Mississippi valley consist of level or rolling grassy plains, called *prairies*. They merge into forest lands on the east and south, into dry plains on the west, and into colder plains on the north.

The chief rivers in the prairie region have cut shallow valleys in the upland through which they flow. The valleys are wider and more numerous in the southern prairies than in the northern.

**Coyote.**

Most of the rain which falls in the prairies is brought by summer winds from over the warm gulf of Mexico. The heaviest rains fall on the parts of the prairies east of the Mississippi. For some distance west of the river there is plenty of rain; but still farther west, towards the dry plains, the crops often suffer in periods of drouth.

The summer rains of the prairies generally fall from thunderstorms. Great cloud-masses several miles high, moving eastward about as fast as a railroad train, give brief rains to belts of country from fifty to two hundred miles wide, but leave dry regions on either side, until other storms come to water them.

**Violent squalls usually blow out from the storms, in front of the rain. Destructive tornadoes sometimes occur beneath the storm-clouds. Houses are often blown down, and trees are uprooted.**

The soil over much of the prairie region is fine, deep and rich. It has been made in various ways. In the southern part of the prairies, the surface has for long ages been exposed to the weather. The slopes being gentle, the soil moves away very slowly and therefore has time to form to a great depth.

The northern part of the prairie region was once covered by the great ice-sheet which moved from the Laurentian highland across the St. Lawrence valley. This ice-sheet dragged much rock waste into the prairies, spreading it out as a deep layer of soil. The waste was scraped from rocks of many kinds, and was ground and mixed under the ice. Soil of this kind is called *till*. The sheet of till has buried many old valleys and has made the northern part of the prairies smoother than it was before the ice-sheet came, and smoother than the southern parts of the prairie region now are.

A third kind of prairie soil is the sediment of shallow lakes that covered parts of the surface, after the ice-sheet had melted back. Some of the finest and richest prairie soils are of this kind.

The prairies in the valley of the Red river of the North were thus formed. These prairies lie partly within the United States and also extend northward far beyond the border of our country, into Canada.

Ages ago a great lake covered the region now known as the Red river prairies. Muddy streams flowed into the lake, and fine soil settled evenly over the bottom. When the lake was drained, the smooth bottom became a level plain. The water flowed off long ago, and yet the plain is so young that streams have hardly cut its surface. The Red river prairies form part of the Nelson river basin.

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[1] Years ago, stakes were set in the plain, to guide travelers across it.

The Mackenzie river flows from the cool belt far into the cold belt. When the spring thawing begins in the southern part of the Mackenzie basin, the water runs northward till checked by the ice which at that time clogs the channels. The streams then spread far over their flood plains, which remain covered till the ice-jams in the north melt away and allow the flood-water to run off.

Floods of this kind occur each year, not only in the Mackenzie basin, but also in every river valley whose main stream flows northward into the Arctic ocean.

Large herds of reindeer, called *caribou*, roam over the cold plain in the far north. In summer they feed on the lichens, mosses and stunted shrubs which grow along the shores of the Arctic ocean. Many thousand caribou live in the so-called *Barren Lands* west of Hudson bay. As the cold season approaches, the deer travel southward into forest regions where they can find food and shelter.

Small tribes of Indians live on the bleak Northern plains, and small bands of Eskimos are found along the shores of the Arctic ocean and Hudson bay. To these people, the deer are of great value. The flesh of the caribou is one of the chief sources of food, and the skins are used in making clothing and tents. Even the bones are shaped into simple tools and weapons.

The basin of the Nelson river is mostly in the cool belt. The southern part of that basin includes the wide fertile prairies of the Red river valley, — famous for their crops of wheat; for although the winters are very cold, the summers have long days of strong sunshine, and plants grow there very rapidly.

It is chiefly from this broad interior region that the eastern and southern parts of our country receive cold winds in winter. In that season the wide cover of snow over the interior plains becomes intensely cold. The lower air is then greatly cooled and tends to flow outward to the warmer regions.

The cold waves are especially severe when one of the whirling westerly storms moves to the Appalachian highland, and the cold winds flow rapidly southward behind it. Freezing air may then be carried even to the gulf of Mexico and to the southeast coast of our country.

The western and northern parts of the Nelson basin are thinly settled. They are forested and abound in many kinds of fur-bearing animals, such as beavers, otters and ermines.

Arctic Ptarmigan.

Several large lakes extend northwestward in the basins of the Nelson and Mackenzie rivers. These bodies of water, together with the Great Lakes, form a remarkable chain stretching along the south and southwest borders of the old Laurentian highland.

### 53. Gulf Coastal Plain.

The broad lowland which follows the seacoast from the Rio Grande to the Hudson river[1] forms one great coastal plain. The part which borders on the gulf of Mexico slopes mainly towards the south, but the Atlantic coastal plain slopes towards the southeast. In all parts the streams flow mostly at right angles with the coast, because that is the direction of the slope which the land took when it rose from the sea.

The Gulf coastal plain is known as the *Southern plain*. The greater part of this plain is low rolling upland. It is cut into eastern and western parts by the wide flood plain of the Mississippi river.

The part near the shore is young, but farther inland the plain is older and much worn by streams that have extended their courses across it from the higher and older interior.

A large part of the Gulf coast is low, sandy and barren. The shallow waters along the shore afford few landing places for large vessels. The harbors are at the river mouths or as far upstream as the tides are felt.

On the western side of the gulf of Mexico, long sand bars have been formed offshore by the waves. Very few inlets to the inclosed lagoons are held open through the bars, because the tides there are weak. Galveston, the chief port of this part of the coast, is built on the end of one of these sand bars.

The Southern plain is in the warm belt and receives heavy rainfall from moist winds that blow from over the gulf of Mexico. The summers are long and hot; the winters are short and mild, except in the northern portion. Near the Gulf coast, frosts are rare and snow is almost unknown.

It is from this region and from over the warm waters of the gulf of Mexico that the "hot waves" of summer are chiefly drawn to the upper Mississippi and Ohio valleys. These hot waves are southerly winds drawn inland on the front of advancing whirls in the westerly winds. The dampness of the Gulf winds makes their heat the more oppressive.

Nearly all parts of the Southern plain were at one time wooded, and forests still cover the greater portion of the region. Pine lumber is a valuable product of these forests.

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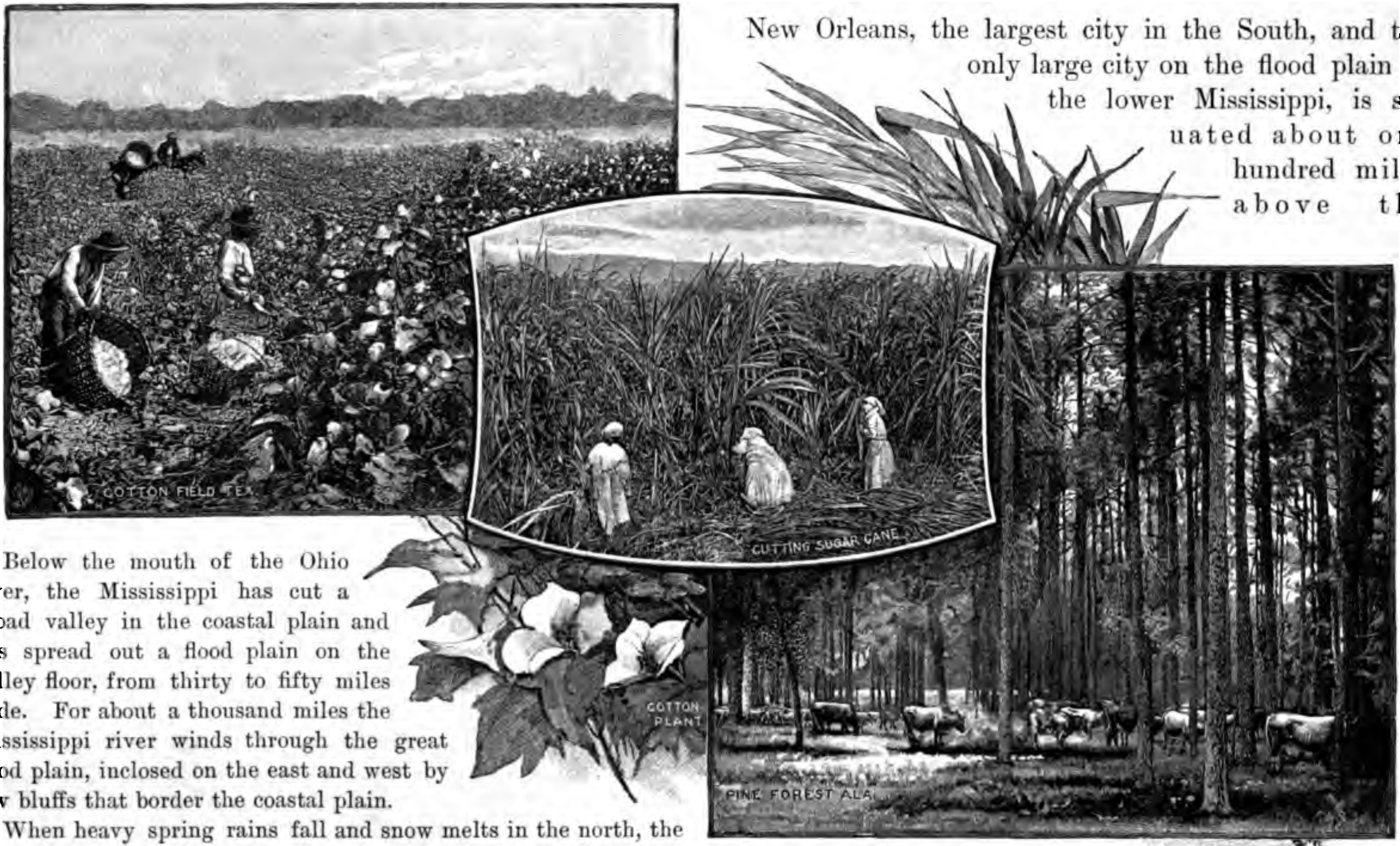
[1] Long Island, Cape Cod, and the lowland east of Mexico, form narrow extensions of this great coastal plain.

Large districts in the South have been cleared of trees and now rank among the most productive parts of our country. Cotton is the leading crop on these cleared lands.

The cotton plant needs very long and hot summers to ripen its seeds and to produce the fiber which grows around them. Cotton fiber is made into cloth, thread and rope. In a later lesson we shall learn much more about this useful plant.

Rice thrives on low flood plains and on the swampy borders of lagoons behind coastal sand bars. At times the rice fields must be flooded to make the plants grow.


COTTON FIELD TEX.
CUTTING SUGAR CANE
COTTON PLANT
PINE FOREST ALA.

Below the mouth of the Ohio river, the Mississippi has cut a broad valley in the coastal plain and has spread out a flood plain on the valley floor, from thirty to fifty miles wide. For about a thousand miles the Mississippi river winds through the great flood plain, inclosed on the east and west by low bluffs that border the coastal plain.

When heavy spring rains fall and snow melts in the north, the great river overflows parts of its lowland far and wide. In times of flood, the river deposits more silt near the main channel than farther away, and the surface of the flood plain therefore slopes gently *away from* the river.

The small rivers coming from the coastal plain into the flood plain of the Mississippi cannot keep their course up the gentle side-slopes of the flood plain to the main river, so they turn down the valley, near the bluffs. One of these rivers, the Yazoo, is shown on the relief map on page 32.

Banks of earth, called *levees*, have been built for hundreds of miles along the great river, to keep the rising water from flooding the fields. In times of heavy floods the levees are often broken; and as the flood plain slopes away from the river, the lowlands are quickly flooded. Thousands of acres of cotton, sugar cane and grain are then destroyed. A break in the levee is called a *crevasse*.

Villages on the flood plain are often built close along the river banks, where there is the least danger from floods, because the banks are the highest parts of the flood plain.

The Mississippi river meanders, or flows in long bends or loops, in the flood plain. Year after year the river wears away the necks of the loops, now and then cutting across one of them. Then the stream flows in its new channel, and the deserted part is left filled with standing water, forming a curved lagoon. Many lagoons on the wide flood plain show former courses of the river.

For ages the Mississippi river has carried down large quantities of silt and built its flood plain far out into the gulf of Mexico, making a great delta. Every minute this broad stream carries into the gulf of Mexico enough silt to fill an ordinary schoolroom.

The low delta plain comprises thousands of square miles. Many parts are marshes and wooded swamps. Other parts are wide stretches of grass land. Many distributary streams cross the delta, and a large number of lakes lie in shallow hollows between them. Between the mouths of the distributaries are large salt bays that the river has not yet filled with silt.

New Orleans, the largest city in the South, and the only large city on the flood plain of the lower Mississippi, is situated about one hundred miles above the mouth of the great river. This city has a large trade in cotton, sugar, rice and other products of the Southern plain. Several other cities, such as Memphis and Vicksburg, are built where the Mississippi river flows against the bluffs. These river ports are important cotton markets.

### 54. Atlantic Coastal Plain.[1]

Southeast of the piedmont belt lies the Atlantic coastal plain. As in the Gulf coastal plain, the region near the sea is young and smooth, while the plain farther inland is older and is more deeply and widely cut by streams that flow across it from the Appalachian highland.

The widest part of the Atlantic coastal plain is southeast of the Carolina highland. Thence the plain narrows northeastward to the mouth of the Hudson river, where the piedmont belt reaches the coast.

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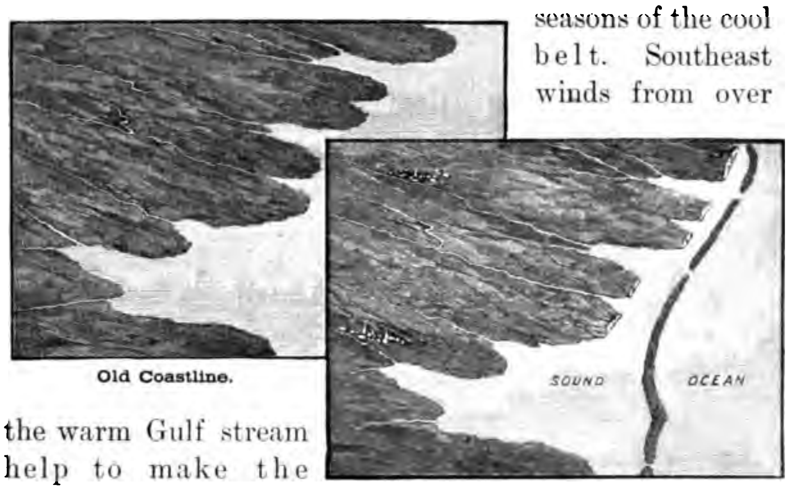
[1] Teachers who so prefer will find no difficulty in going from this lesson directly to the later lessons on the United States, — its people, resources, commerce, etc. Most teachers, however, will doubtless continue to present the topics in the order in which they appear.

The southern part of this coastal plain is in the warm belt and has seasons like those of the Gulf coastal plain. The northern part of the Atlantic coastal plain has the seasons of the cool belt. Southeast winds from over the warm Gulf stream help to make the winters of this coastal plain milder than those of the inland regions in the same latitude.



**Old Coastline.**

**New Coastline showing Bars.**

The long Atlantic coastal plain has plenty of rainfall. It is brought by winds from over the gulf of Mexico and the Atlantic ocean.

The higher and older part of the coastal plain, where the rivers have worn wide valleys and made fertile flood plains, is rolling or hilly. The southern half of this upland country, like the piedmont belt which adjoins it, is famous for its cotton crops. Farther north, tobacco is a leading crop of the uplands and the piedmont. The soil is also suited to the growth of grain.

In the lower and younger part of the coastal plain, where the land is flat and little worn, the rivers are sluggish.

Large parts of the younger coastal plain are covered with forests of pine. These yield turpentine, rosin and lumber. This lower part of the plain is also noted for its fruit groves, — oranges in the south and peaches in the north. Great quantities of early vegetables are raised in the younger coastal plain and are shipped mostly to the large northern cities.

When the smooth sea-bottom was lifted up to form the Atlantic coastal plain, it made a very regular coastline. Since valleys were worn in the plain, the northern and middle portions have partly sunk beneath the sea, drowning the lower parts of the valleys and thus making bays with excellent harbors. Among these are New York, Delaware and Chesapeake bays. Near the heads of these bays are situated the great ports of New York, Philadelphia and Baltimore.

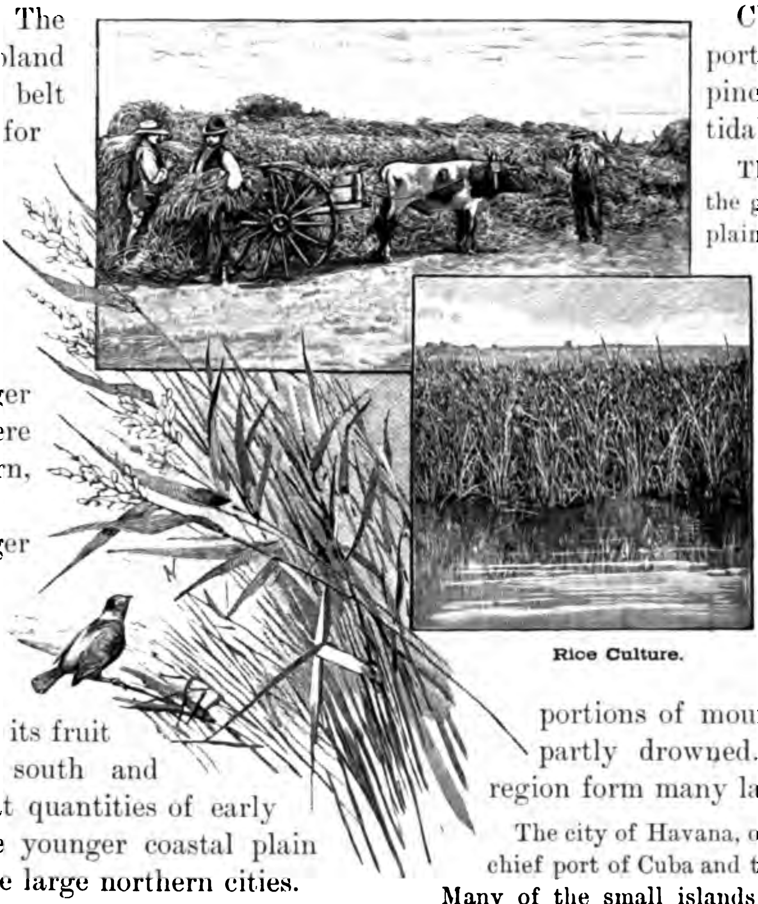
Several large cities are built on the rivers along the line where the piedmont belt meets the coastal plain. The rivers are there broken by falls or rapids that give fine water power. In the northern and middle ports of the coastal plain, where the valleys have been slightly drowned, the larger streams, as far as the falls, are open to vessels from the sea. Richmond, near the lower falls of the James river, is a good example of this class of cities.

In the southern part of the plain, the land slopes so gently under the sea that good harbors are found only in the river mouths. Sand bars, built by waves, lie along the coast and partly inclose many sounds. Inlets through the sand bars are kept open by tidal currents.

The best cotton in the world grows on some of these border islands and on the shores of the mainland near by. The soil is sandy, but the plants which grow in it produce long and fine fibers.

Large quantities of rice are raised in the wet lands in the warmer parts of the Atlantic coastal plain, as well as in the Gulf coastal plain. This grain thrives in lagoon swamps inside the sand bars, and in river swamps which at certain times can be flooded or drained.

Charleston and Savannah are important ports for cotton, rice and pine products. These cities are on tidal rivers and have good harbors.



**Rice Culture.**

The peninsula of Florida, lying between the gulf and the ocean, is chiefly a coastal plain formed by the uplifting of the sea-bottom, but partly also the work of coral polyps. Tiny creatures of this kind, in countless numbers, are still very active in building the southern portion of the peninsula farther out into the warm Gulf stream.

Southeast of Florida lie the low Bahama islands.[1] These consist mainly of huge banks of shell and coral limestone. Only small parts of the great banks rise above the sea.

The islands of the West Indies are mostly the upper portions of mountainous country that has been partly drowned. The flooded valleys in this region form many large and deep harbors.

The city of Havana, on one of these drowned valleys, is the chief port of Cuba and the largest seaport in the West Indies. Many of the small islands of the West Indies stretching in a chain to the northern coast of South America are almost wholly volcanic. These are known as the Lesser Antilles.

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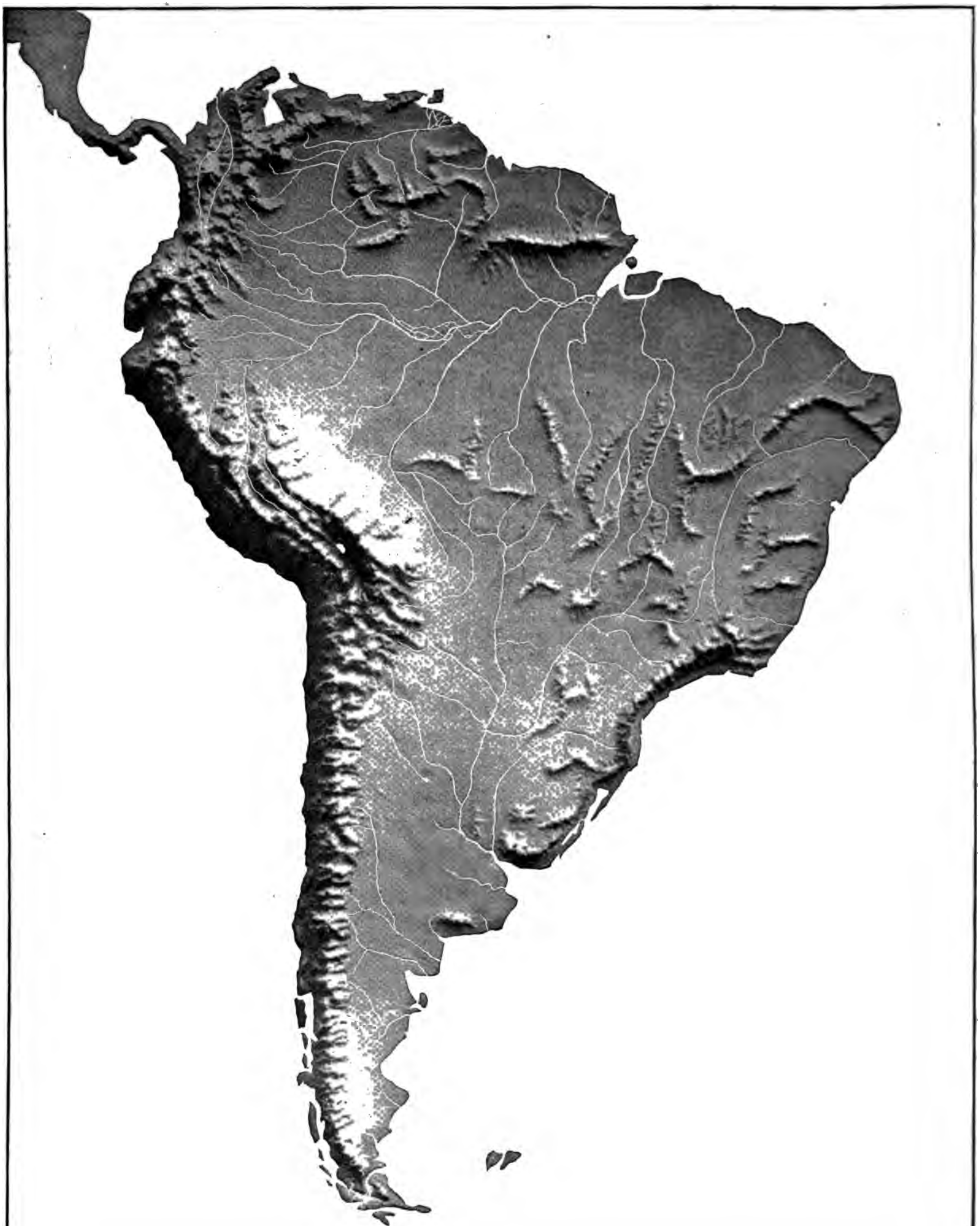
[1] Neither the Bahamas nor the West Indies are parts of the coastal plain, but owing to their position they may be studied here.



RELIEF MAP OF SOUTH AMERICA.

### 57. The Southern Andes.

The southern portion of the Andes has partly sunk beneath the sea. Many fiords now occupy deep valleys worn in the western slope. Ridges and peaks that the sea did not entirely cover form a fringe of islands.

Cape Horn is on one of these rocky islands, at a little less than two thirds of the distance from the equator to the south pole. Near Cape Horn the sea is often made very rough by the stormy westerly winds. For this reason, steamships go through the strait of Magellan, instead of rounding the cape. Small bands of Indians, known as *Fuegians*, live on the islands south of the strait.

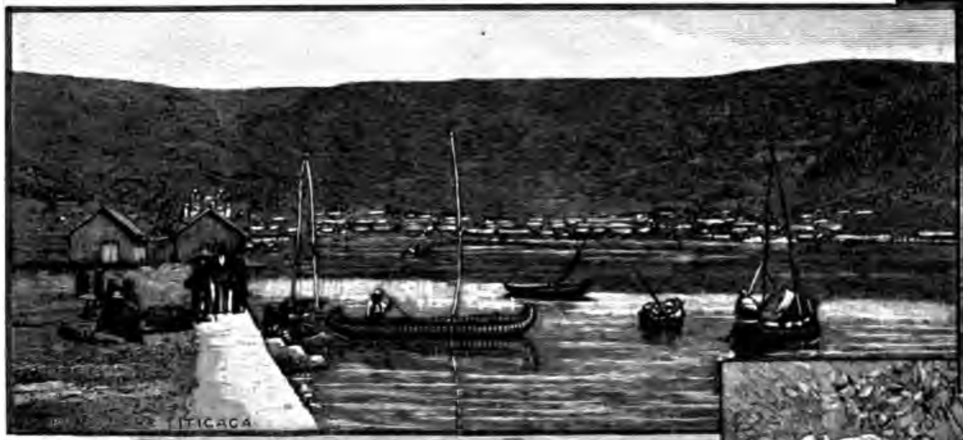
**Cape Horn.**

About halfway between Cape Horn and the sharp bend in the Pacific coast, the Andes chain is very high. Some of the peaks are more than four miles above sea level and are white with snow all the year.

West of this part of the Andes lies the long and narrow plain of middle Chile. The land near the sea is rugged but not very high. The plain is between this rough coast land and the Andes.

We have learned that the belt of westerly winds moves north and south with the sun. In the cold season these winds blow nearer the equator than in the hot season.

The plain of Chile, like the valley of California, is crossed by the stormy westerly winds in winter, but in the summer season these winds move farther from the equator, beyond both these regions. The cold months therefore form the wet season. Owing to the winds from over the cold ocean current on the west, Chile has no very hot season.



The rivers which cross the plain of Chile are short. In times of heavy rain and thaw they overflow parts of the plain and deposit fine soil for the next season's crop of wheat, barley and corn. In the hot months, when the westerly winds move away to the south, the streams are fed by snow melting on the high slopes of the Andes. A large amount of the river water is turned into canals and ditches to irrigate the grainfields and vineyards. Valparaiso is the chief port in Chile.

Below the snow line the west slope of the southern Andes is heavily wooded. Among the trees are pine and oak.

The mountain pass shown in the picture is not far from the great volcanic cone of Aconcagua. This pass is two miles and a half above sea level, -- higher than many clouds. In some parts, long slopes of coarse rock waste rise on either side, and there is neither water nor fuel.

Years ago the journey across this highland was made on mules or on horses. A railroad now crosses the Chilian Andes.

There are many volcanoes in this region, and earthquakes are frequent.

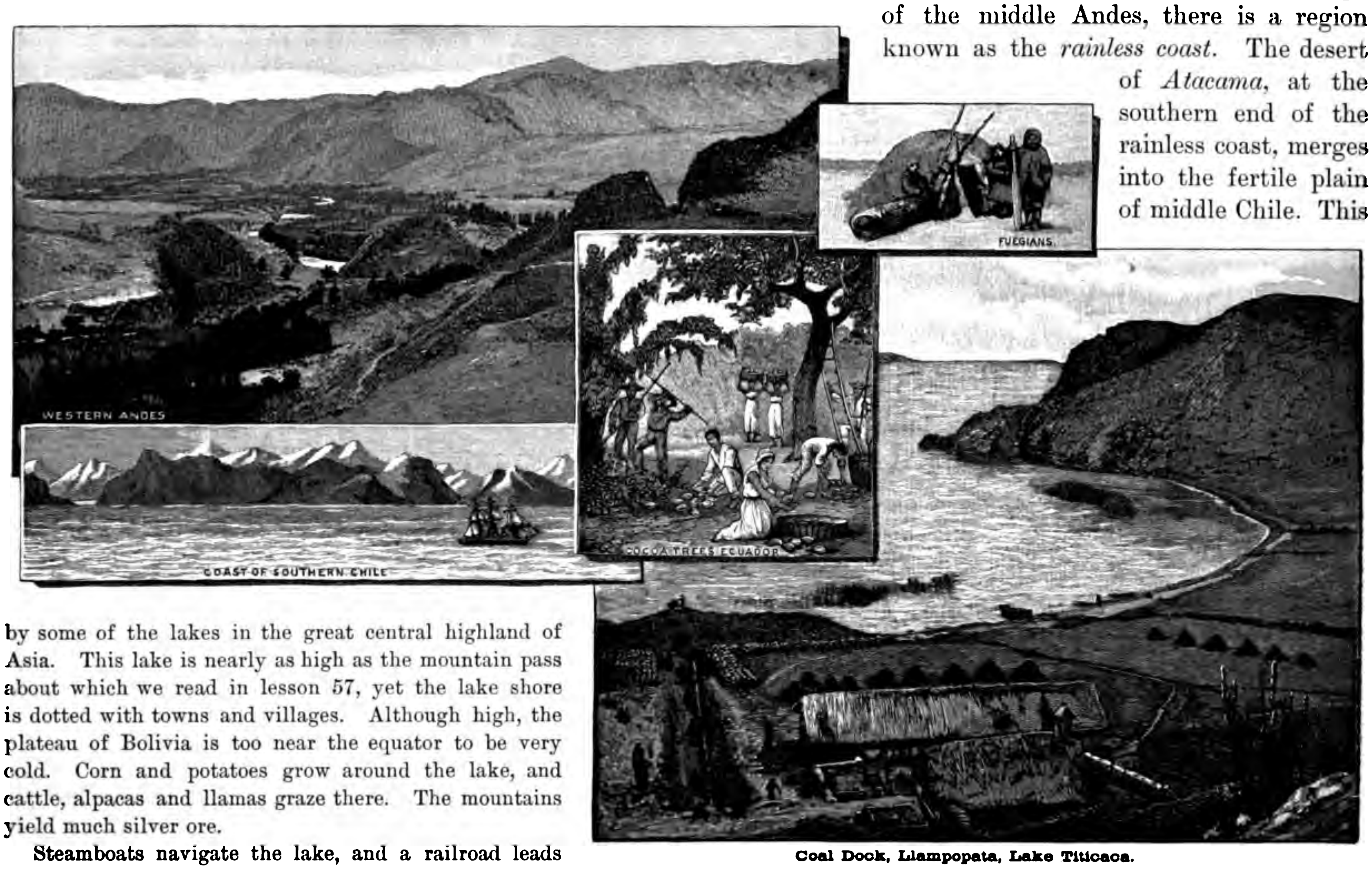
### 58. The Middle Andes.

The plateau of Bolivia lies in the widest part of the Andes. It is the highest plateau in America and is shut in both on the east and the west by lofty ranges. The plateau of Bolivia averages about 12,000 feet in height. It is three times as high as the Great Basin in North America.

On the plateau of Bolivia there is a large sheet of water, known as *Lake Titicaca*. This lake has an outlet which carries a small portion of the water southeastward, but much of the water evaporates and the lake is therefore slightly brackish. The outlet does not reach the sea but flows into a salt swamp.

Lake Titicaca is in the northern part of a region having no drainage to the sea. This region extends southward into Patagonia.

Titicaca is the largest lake in South America and is the loftiest large body of water in the New World. It is only surpassed in height by some of the lakes in the great central highland of Asia. This lake is nearly as high as the mountain pass about which we read in lesson 57, yet the lake shore is dotted with towns and villages. Although high, the plateau of Bolivia is too near the equator to be very cold. Corn and potatoes grow around the lake, and cattle, alpacas and llamas graze there. The mountains yield much silver ore.



Coal Dock, Llampopata, Lake Titicaca.

Steamboats navigate the lake, and a railroad leads down to the coast. The steamers and cars connect at the town of Puno which is shown in one of the pictures on the opposite page.

Northwest of Bolivia the plateau is neither so wide nor quite so high. In the Andes of Peru, the ranges on the east are separated by long and deep valleys in which many rivers flow to the lowlands. The rains of the trade winds are very heavy on this eastern mountain slope which is therefore covered with dense forests.

Many years ago a band of white men from Spain, in Europe, went into the highland of the middle Andes. They found there a race of Indians whose rulers were called *Incas*, and the same name was given to all the people who were ruled by the Incas.

The Indians had cities built of hewn stone, and their roads and bridges were better than any that the Spaniards who went there could make. Cuzco was the chief city of the Incas, and it still contains ruins of their beautiful stone work.

The Spaniards were very cruel to the Indians and made slaves of them. The descendants of the Incas still live on the highland, but white men are rulers of the whole land.

Have you ever tasted quinine, — a bitter medicine that is often used to cure fevers and colds? It is made out of the bark of cinchona trees. These grow wild in forests on the east slope of the middle Andes, and have been transplanted into other warm lands. Much of the bark is stripped from trees. Some of it is also taken from slender shoots that spring up from the roots of trees which have been cut down. The descendants of the Incas gather large quantities of the bark.

For more than a thousand miles along the west slope of the middle Andes, there is a region known as the *rainless coast*. The desert of *Atacama*, at the southern end of the rainless coast, merges into the fertile plain of middle Chile. This desert is at the northern end of the country of Chile.

Although close by the sea, the slope descending to the rainless coast is barren except in the flood plains of several small rivers. This region, like the dry west coast of Mexico, is too near the equator to feel the storms of the westerly winds and is not near enough to the equator to receive rain from the shifting equatorial rain belt.

The small rivers of the west slope are fed by rain and by snow melting on the high parts of the ranges which are reached by trade winds from over the Atlantic.

### 59. The Northern Andes.

In the northern part of the Andes are many high and wide valleys, walled in by mountain ranges. Some of these valleys are covered with coarse wash from the mountains and are dry and barren. Others are coated with fine soil, largely made of weathered volcanic ash. One of the most noted of these high valleys is that of Quito, a little less than two miles above sea level.

The valley of Quito is in the midst of the most noted group of volcanoes in the world. There may be seen cones so old that their sides are deeply cut by streams, and cones smooth with recent flows of lava and showers of ashes.

Some of the volcanoes are very active. Cotopaxi, about twice as high as the plain of Quito, is the loftiest *active* volcano known. The summit of this great cone is buried in snow and is often hidden by clouds. Another famous peak is Chimborazo. This giant cone is higher than Cotopaxi but is not active.

One volcano, named *Sangay*, in this group is the most active known. It throws out a jet of lava four or five times an hour. The stream rises several hundred feet into the air. Once in a while a larger stream of molten rock is belched forth to a height of more than one third of a mile. The country is shaken, and sounds like the heaviest thunder are heard.

Many earthquakes occur in this volcanic region. For this reason most of the houses are built low and flat. They are made chiefly of sun-dried bricks. During one earthquake, about a century ago, forty thousand people are said to have been killed in Quito.

Condor.

In the extreme north the Andes divide into three main ranges. The western range is not very high and it ends near the isthmus of Panama. The middle chain runs almost due north. The eastern range curves for some distance along the northern coast.

The long valleys east and west of the middle chain are drained by the Magdalena river and its branches. The Magdalena river is the chief water way in Colombia and is navigable for many miles from the sea.

Many cities and towns have been built in lofty valleys among the northern Andes. These valleys, although near the equator, are too high to be very hot.[1] The climate of the low coast region is hot and unhealthful. The coast towns serve as ports for the upland cities.

Chimborazo.

The great vulture called the condor is often seen high up among the Andes. This huge bird, the largest that flies, lays her eggs on bare crags where they are generally safe from enemies.

The condor is so strong that it often kills sheep, young llamas and other animals. For this reason, the people who live in the lofty Andean valleys are glad when one of these birds is slain.

The northern Andes are in the belt of equatorial rains. The eastern slope, which receives the rains of the trade winds, contains the sources of many large rivers. From the western slope, several smaller streams flow into the Pacific. There are forests on both sides of the highland, but those on the east are much the denser, as the rainfall is there so heavy. On the western coast, the equatorial rain belt does not shift very far south, because the heat equator is there pushed northward by the cool ocean current.

## 60. The Highland of Brazil.

The highland of Brazil is shaped like a triangle, with one side lying along the east coast. This coastal part is the highest. As a whole, the highland of Brazil is only about one sixth as high as that of the Andes, or about equal to the Appalachian highland.

The coast ranges of Brazil turn many river branches inland. These streams reach the sea by flowing round the ends of the ranges. Thus the San[1] Francisco river winds northward through a wide valley a thousand miles long, before it finds an opening to the sea. Other streams are turned inland by the coast range farther south, and they reach the sea through the broad mouth of the La Plata river.

Long rivers flow northward and southward from about the middle of the highland of Brazil. This part of the highland is a plateau, not yet deeply cut by streams. Farther north and south, deep and wide valleys have been worn in the plateau, leaving long ridges between them. Rapids and falls abound in most of the streams and make them unfit for water ways.

The coast of this highland region is not broken by long bays. The best harbor is that of Rio Janeiro. It is deep and broad, and ranks among the finest in the world. Rocky reefs help to form harbors in some places along the coast of Brazil. *See picture below.*

A large part of the highland of Brazil is reached by the equatorial rain belt. The hot months therefore form the wet season. In the dry season, there are heavy night dews, with occasional rains from the trade winds as they rise over the highland.

Harbor of Pernambuco.

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[1] Near the strait of Magellan the snow line is only half a mile above sea level. Towards the north the snow cap shrinks farther away from the lower level, till near the equator it is three miles high. The parts of the ranges above the snow line are dreary wastes of snow and ice.

[1] The English form of the Portuguese word São is San.

Towards the coast, dense forests cover large areas in this highland. In the inland region, where the rainfall is lighter than it is near the coast, there are wide grassy plains known as the *campos*. Herds of cattle graze on the campos.

Many useful plants are raised on the highland,—chiefly in the rainy eastern part. Among these are coffee, sugar cane, cotton and cassava.

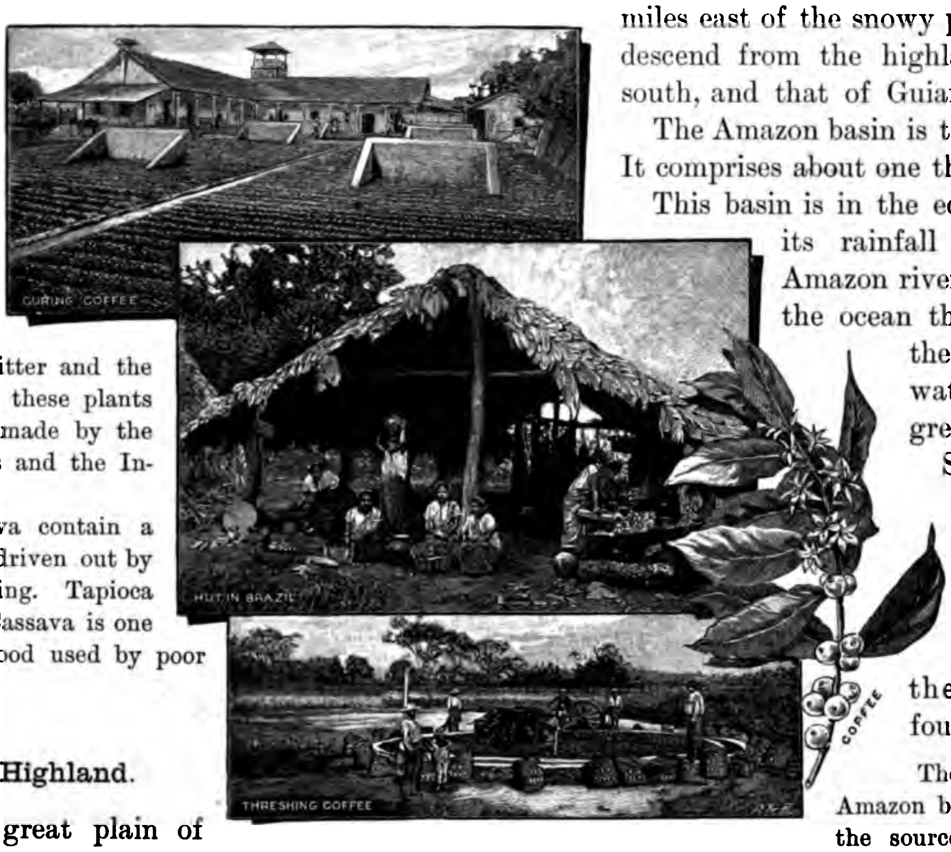
Coffee is the leading product in this region. The coffee trees or shrubs thrive in lands having warm weather all the year, with plenty of rain. In Brazil they grow best on the plateau and the slopes of low ranges, at quite a distance from the sea.

Each coffee berry has two seeds. These are baked and ground, before being used.

Rio Janeiro is the greatest coffee market in the world.

There are two species of cassava plant,—the bitter and the sweet. From the roots of these plants many kinds of food are made by the white people, the Negroes and the Indians of Brazil.

Roots of bitter cassava contain a deadly poison, but this is driven out by grating, pressing and baking. Tapioca is made from this root. Cassava is one of the chief articles of food used by poor people in Brazil.



## 61. The Guiana Highland.

On the north the great plain of South America is broken by the Guiana highland.

This highland is for the most part a much-worn plateau, with flat-topped hills and mountains rising in high cliffs from wide valleys. One of these table mountains, near the central part of the highland, rises about a mile and a half above sea level, but most of the peaks are not half so high.

This highland is reached by the equatorial rains and therefore has its wettest season during the hot months. In all seasons, the highest portions are well watered, for the trade winds give out rain as they rise over the highland.

On the north of the Guiana highland lies a wooded coastal plain. Large swamps that extend along the shore are the home of many alligators. The slope passes so gently under the sea that at low tide wide tracts of sand and mud are laid bare.

Much of the south slope of the highland consists of rough hills and bare rocky valleys, for the winds from the sea give their rains mostly to the northern slopes.

Find on the map the Essequibo river. This stream flows from the plateau through a dense forest and is noted for its grand cataract. The river has cut a long gorge about an eighth of a mile deep, into the head of which the water now plunges.

## 62. The Selvas.

The slopes east of the crest of the Andes are mainly in three great river basins. The divides between these basins cross the highlands of Brazil and Guiana, and the lowlands farther inland.

The Amazon basin is between the other two. The highest parts of its long slope are in the Andes. The lowest parts are coastal swamps, more than two thousand miles east of the snowy peaks. The side slopes descend from the highland of Brazil on the south, and that of Guiana on the north.

The Amazon basin is the largest in the world. It comprises about one third of the continent.

This basin is in the equatorial rain belt and its rainfall is very heavy. The Amazon river carries more water to the ocean than any other river in the world. Its muddy water is seen at sea for a great distance from land.

Some branches of the Amazon rise in the Andes, and the water which follows the winding banks down from these sources to the mouth flows about four thousand miles.

The nearest approach of the Amazon basin to the Pacific ocean is the source of the Paute river, in Ecuador, only about *thirty* miles east of the gulf of Guayaquil. No other river in South America, flowing to the Atlantic ocean, rises so near the Pacific coast.

The main branches of the Amazon are the Madeira river on the south and the Negro river on the north.

Large steamers go up the Amazon from the sea to the foothills of the Andes. For great distances many of the tributaries are deep, wide, and free from rapids. The length of navigable streams in the Amazon system is greater than the distance round the earth.

Part of the wide mouth of the Amazon has so strong a tidal wave, or bore, that boats cannot outride it. No towns are situated on the shore swept by this tidal wave.

This is one of the great rivers which make flood plains. For this reason the lowlands are nearly level,—sloping only a few inches to the mile. The streams there are sluggish and the silt which they carry is very fine. In the rainy season the rivers in the lowland generally rise thirty or forty feet and spread far and wide over the flood plain.

Dense forests, called *selvas*, cover the lowlands of the Amazon basin. Long vines hang from the trees, and reeds and rushes grow in the wet soil, forming a network so thick in some places that one cannot pass through without first cutting a path.

Tree ferns and palms in great variety grow in the selvas. Many beautiful birds live among the high tree tops.

Lesson 113 describes some of the large animals of the selvas and of other parts of South America. Perhaps you would like to read that lesson, but you need not study it at present.

Many small tribes of Indians live near the banks of the streams. These natives catch fish in the rivers, and animals in the forest.

Large rubber trees grow on the hot and damp banks of the Amazon. Deep cuts are made in the bark, and cups are placed beneath them to catch the milky juice which oozes out. When heated in certain kinds of smoke, this juice dries, thickens, and forms rubber of a fine quality.

Natives of the Selvas.

Another kind of rubber tree grows on the plateau of Brazil. The outer layer of bark is stripped off to the height of about five feet from the ground. The sap then runs out and hardens on the tree. After a few days this rubber sap is ready for market.

India rubber is made from the sap of many kinds of trees and shrubs that grow in nearly all hot and damp parts of the earth. Name some of the uses of rubber.

Rosewood trees also grow in the selvas. The color of the wood is deep red-brown, with streaks of dark resin.

Piano cases, chairs and tables are often carved in rosewood, because it takes such a fine polish. Wood that is used in making choice furniture is called *cabinet wood.* Many kinds of trees in Brazil supply cabinet wood.

Several species of trees that abound in the selvas yield dyes. Among these are logwood trees. Thin chips are cut from the trees and are kept moist. Green crystals form on the chips, and these crystals are used in dying cloth.

Dyes of various kinds are made from logwood. Some of these are used to give the color in blue woolen cloth, purple calico, and black prints.

Para, being near the mouth of the Amazon, has a very large trade in rubber and other products of the selvas.

## 63. The Gran Chaco and the Pampas.

South of the Amazon basin lies the La Plata basin. It reaches from the crest of the Andes on the west to the crest of the coast range on the east.

This basin is about one half as large as that of the Amazon. The main stream is the Paraná river which flows into the broad La Plata river.

The lowland of the La Plata basin is a young plain in which the rivers have cut only narrow and shallow valleys. The northern part of this plain is called the *gran chaco*, or *great hunting ground*. South of the chaco the plain takes the name of *pampas*, meaning *fields*. The pampas extend also far south of the La Plata basin.

We have read about the winter rains on the plain of Chile. At that time the valley of the La Plata has its dry season. In summer, when the belt of westerly winds moves southward, moist northeast winds from over the Atlantic bring the wet season to the chaco and the pampas. The interior parts of these regions are so far from the sea that their rains are not heavy.

Deep rich soil covers large portions of the La Plata plain, and its grass feeds millions of cattle, sheep and horses. Much grain also is raised in this region. In some places there are clumps of tall coarse grass covered with soft plumes. This is known as *pampas grass*.

The grassy plains merge into forest land on the north, into long plains of gravel on the south, and into salty plains and brackish marshes on the west. These marshes lie between low ranges rising from the plain.

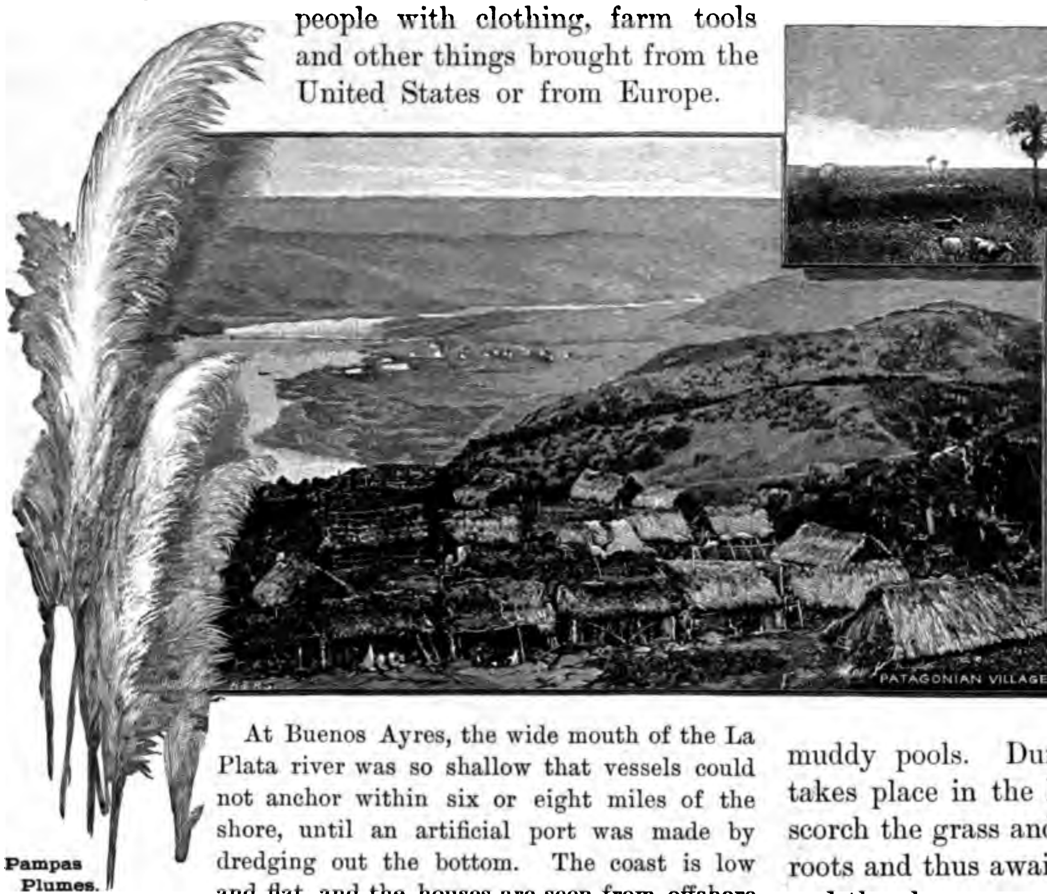
The streams of the chaco run into the Paraná river. Many of the rivers which flow from the western highland towards the pampas dwindle away in the plain and do not reach the sea, because the rainfall is light and the water evaporates or sinks into the sandy soil.

The great gravel plains south of the pampas extend to the strait of Magellan and are known as the plains of Patagonia. These plains are not a single level stretch, but they consist of wide terraces, some of which are fully two hundred feet above the next lower on the east. These step-like plains rise from the coast towards the mountains.

The plains of Patagonia are in the belt of westerly winds, but receive only moderate rainfall, because the western slope of the lofty range takes most of the moisture.

This region is crossed by several shallow rivers, flowing from the Andes. The flood plains of the larger rivers are fertile, but many of the streams dwindle away for want of rain.

The white people who live in the La Plata basin have great farms but few factories. These people send cattle and grain to Buenos Ayres, the chief port of the Argentine Republic. This city supplies the people with clothing, farm tools and other things brought from the United States or from Europe.



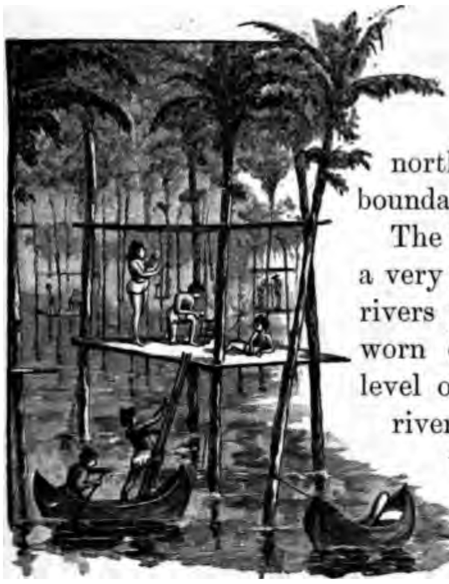
Pampas Plumes.

At Buenos Ayres, the wide mouth of the La Plata river was so shallow that vessels could not anchor within six or eight miles of the shore, until an artificial port was made by dredging out the bottom. The coast is low and flat, and the houses are seen from offshore before the land itself appears.

The city of Montevideo, on the northern shore of the La Plata mouth east of Buenos Ayres, has a good natural harbor and has therefore grown to be the chief port of the country of Uruguay.

### 64. The Llanos.

The third large river basin in South America is that of the Orinoco. On the south it adjoins the basin of the Amazon. On the west and north the Andes form the boundary.

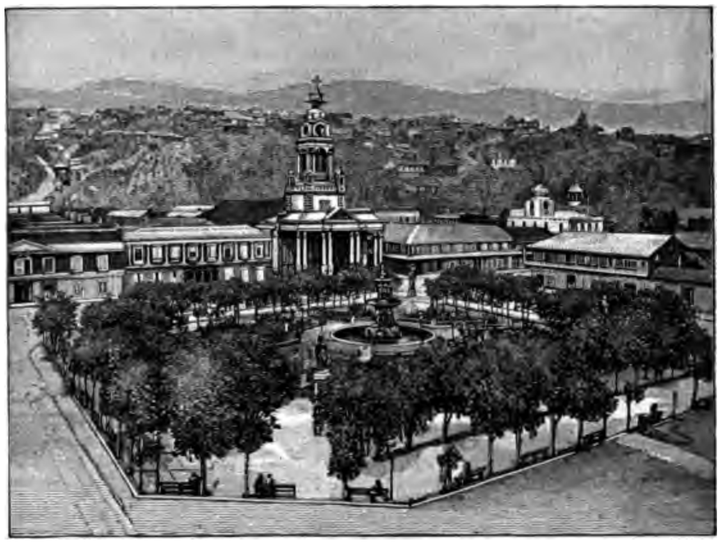


Tree Dwellers of the Orinoco.

The lowland of this basin is a very young coastal plain. Its rivers flow in narrow valleys worn only a little below the level of the plain. The main river has made a large delta that is low and swampy.

The plains of the Orinoco are called the *llanos*. When the sun is north of the equator, they are visited by the equatorial rain belt. The rivers are then swollen by heavy rains, and spread far and wide over their flood plains. Immense herds of cattle and droves of sheep feed on the rich grass which springs up all over the wet plains. The region then teems with life.

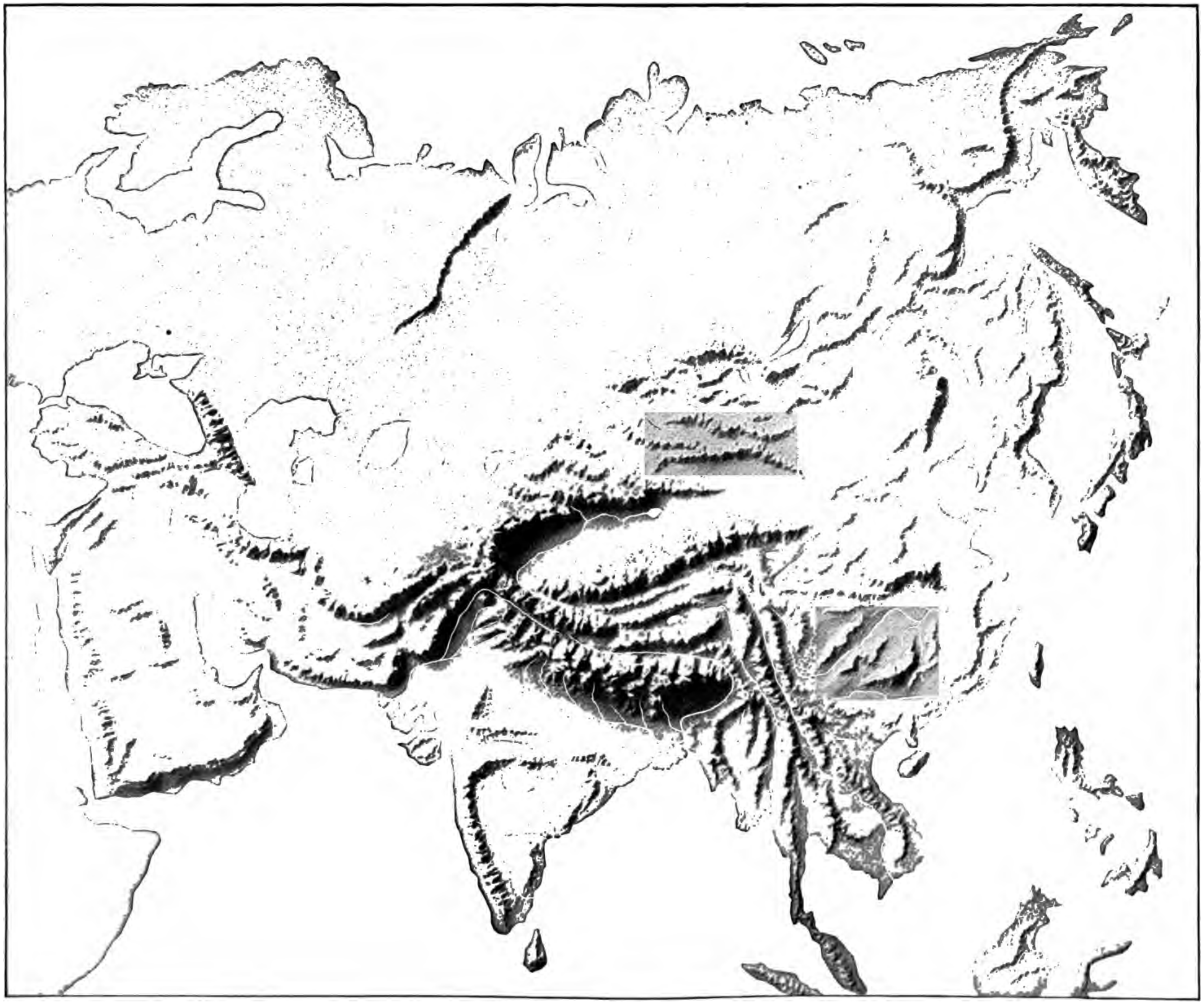
As the sun's rays become more and more slanting the rains leave the llanos and move south towards the campos. The overflow in the lowland is slowly drained off. The rivers then grow smaller and shrink away from their banks. Turtles and snakes bury themselves in the mud. The smaller streams dry away, leaving only parched beds with here and there muddy pools. During the dry season a great change takes place in the life on the plains. Hot trade winds scorch the grass and other plants. They die down to the roots and thus await the return of the rains. The cattle and the sheep move into the flood plains or are driven to the grass lands among the border foothills. The plain becomes almost a desert.



A Square in Montevideo.

In some places it is difficult to trace the divides between the three great river basins of South America. The Orinoco river and Rio Negró tributary of the Amazon are connected by the Cassiquiari river. Tributaries of the Amazon and Paraguay rivers, navigable by canoes, are separated by only three miles of plain.

With the exception of a few rapids and the portage of three miles, a person might journey in a canoe from the delta of the Orinoco to the broad mouth of the La Plata.



RELIEF MAP OF ASIA.

# ASIA.

## 65. Map Studies.[1]

Which is the larger, — North America or Asia? What strait separates these continents? Name the smallest ocean lying between them? What other oceans border on Asia?

What continents lie on the west and southwest of Asia? What name is given to Europe and Asia together?

What heat belts cross Asia? What have you learned about the season winds, or monsoons, over the Indian ocean? *See page 24.* Over what continent must the westerly winds blow before reaching central Asia?

Which is the coldest coast of Asia? In what direction does the main portion of the Asian highland extend? Which part of this highland looks the highest? Compare the Asian and Rocky Mountain highlands as follows: Which looks the higher? — The wider? — The longer? *See globe maps.*

On which side of the Asian highland is the plain of Siberia? Name three rivers which cross this plain. In what direction is the central plain of North America longest? In what direction is the northern plain of Eurasia longest? Which of these vast plains is the larger? In which heat belts does the northern plain of Eurasia lie?

Into what sea does the Amur river flow? — The Yang-tse river? *See colored map of Asia.* Name two streams that cross the plain of China?

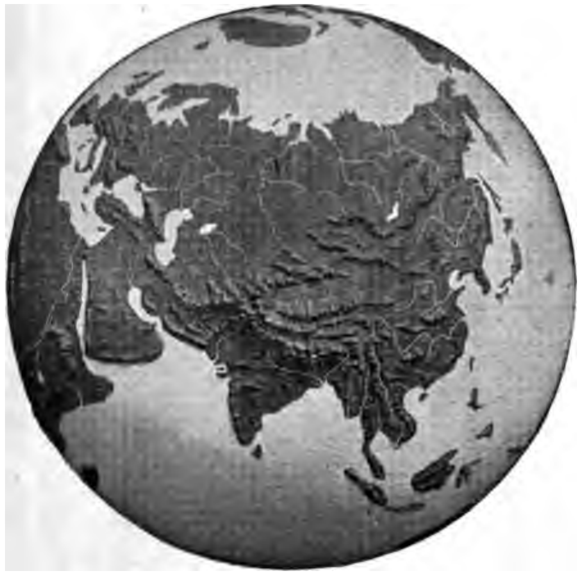
What river runs eastward in the plain of India?

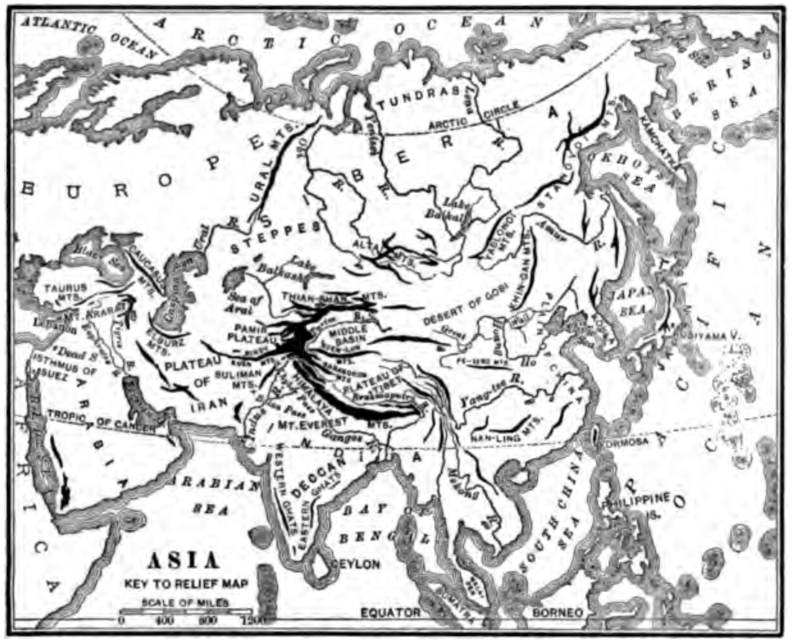
Draw the general shape of Asia, by using three or four straight lines. What is the trend of the Arctic coast? — Of the Pacific coast? — Of the Indian coast?

Sketch each of these coasts. Which is the most irregular? Which is bordered by the greatest number of islands?

What seas partly surround the peninsula of Kamchatka? — The peninsula of Korea? — The peninsula of the Deccan? — The Arabian peninsula?

Locate the following islands: Borneo, Sumatra, Ceylon, the Philippine and the Japanese groups.


**Eurasia.**



**The Northern Hemisphere.**

## 66. Asia.

Asia covers about one twelfth of the earth's surface, includes nearly one third of the total land surface, and is larger than all America. This continent may be roughly divided into three parts, — wide and lofty central highlands, with broad plains on the north and narrower plains on the east and south. The great Asian highland extends northeast and southwest.

The peninsulas on the south of Asia project far into the hot belt, while the Arctic coast lies wholly within the cold belt.

The central part of Asia is an interior basin at a long distance from the sea. This great basin is inclosed by lofty ranges and therefore has but little rain. The northern slope is in the path of the westerly winds but is far from the Atlantic ocean. The rainfall on that slope is therefore light. Summer monsoons yield heavy rains to the south and southeast slopes of Asia.

While the sun is north of the equator the broad surface of Asia becomes greatly heated. The heat is the more intense because of the dryness of the middle desert region.

As soon as the air over the land becomes hot and light, the cooler and heavier air over the oceans flows in and pushes the lighter air upwards. The moist sea-winds blow landward while the hot season lasts.

Summer winds moving inland from over the Arctic ocean yield but little rain to the northern slope, for they are flowing towards warmer surfaces and can therefore hold more moisture than they bring. The heaviest rains are given to the south and southeast slopes of Asia, by the winds from over the Indian and Pacific oceans, because these damp winds are moving into cooler belts and up the high border ranges.

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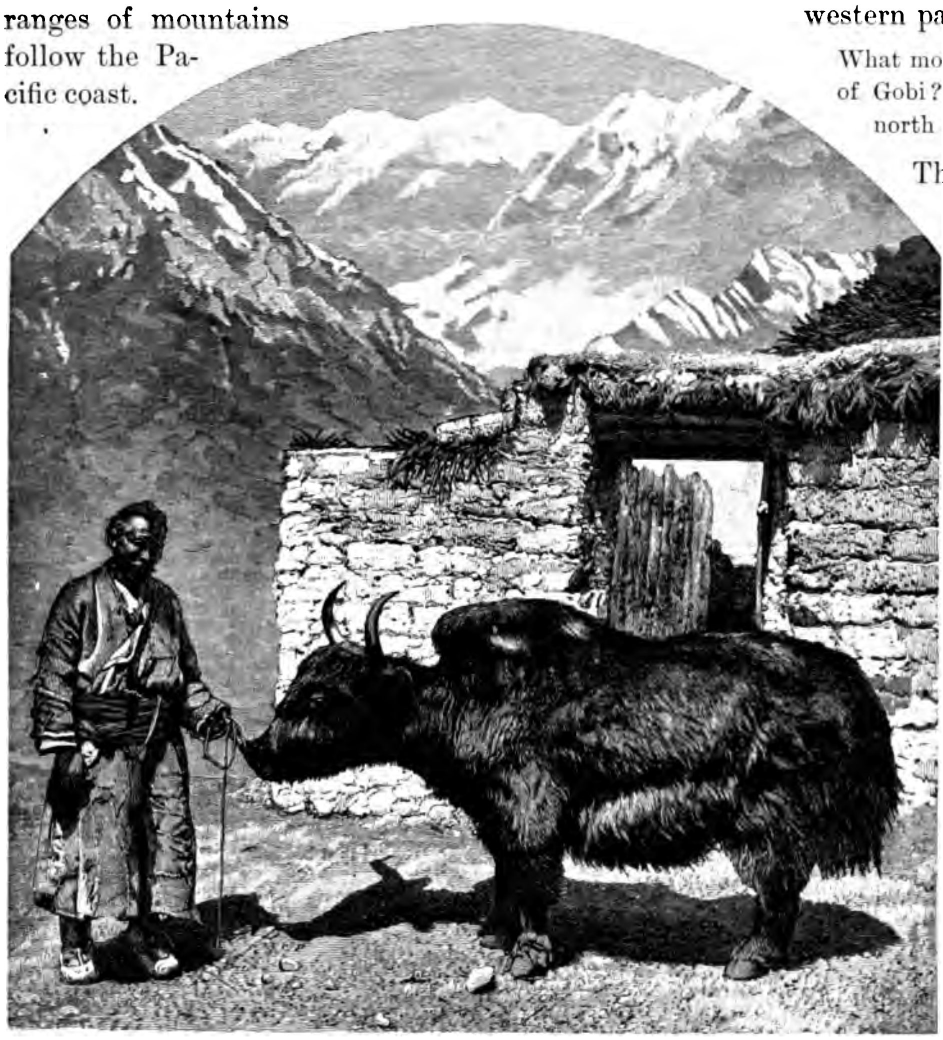
[1] See drawing and modeling *guide map* in *Supplement.*

When the sun is south of the equator, the great central highland with its desert region becomes very cold. The cold air being heavy then flows seaward and yields hardly any rain.

### 67. The Altai Highland.

From the rocky shore of Bering strait the world ridge turns to the southwest in Asia. For a long distance low ranges of mountains follow the Pacific coast.



A Tibetan and his Yak (Himalayas).

What range is near the northwest shore of the sea of Okhotsk? Where is the Yablonoi range?

The Yablonoi range runs into the Altai highland which extends inland towards the middle of the continent. The Altai plateau is about as high as the Great Basin in the United States.

The Altai highland is in the belt of the westerly winds, but their direction changes greatly with the seasons, because the air over this great continent is by turns very warm and very cold. The rainfall of this far-inland region is light. Most of the rain falls on the mountain ranges.

In what direction do most of the streams from this highland flow? What heat belt crosses it? What part of North America is in the same belt?

The Altai highland and a large part of the great plain on the north are forested with cone-bearing trees. In the broad valleys among the ranges, grain thrives and cattle find good grass land. Most of the towns in this region are built near the foot of the mountains, where the streams can be used to irrigate the land.

### 68. Central Basin Region.

The dry Basin region of central Asia is south and southeast of the Altai highland. The eastern part of this almost rainless basin is called the *desert of Gobi*. The western part is the *Middle Basin*.

What mountain range lies along the eastern border of the desert of Gobi? What high ranges inclose the Middle Basin on the north and the south?

The desert of Gobi is about as high as the Great Basin in our country, — 4000 feet. The Middle Basin is not quite so high.

The Basin regions of Asia and North America are alike in many respects. They are at about the same distance from the equator, — nearly halfway to the north pole. Their surfaces are broken by low ranges, between which lie long troughs. None of their streams reach the sea, but all waste away or flow into salt lakes or marshes.

In both basins, the sides of the trough-like valleys are covered with coarse waste from the ranges, while the middle parts of the valleys receive the finer waste carried by the few streams. Strong winds that sweep over portions of the surface, lay bare the rocky ledges, and drift the sand into dunes. Most of the towns are built near the mountains where the streams flow out into the open valleys. These streams are fed mostly by rain or by snow melting on the high border ranges.

Less than half the region marked *Gobi* on the maps is really a barren waste. The desert runs east-and-west through the central portion, and even that is not so barren as the Middle Basin farther west.

In eastern Gobi, summer rains sometimes last for two or three days. Grass then springs up and provides food for the camels and horses in the caravans which carry tea from China to Siberia, whence it is taken to Russia. Over a large part of the so-called *desert of Gobi*, camels and sheep eke out a living on grass and bushes.

When it is noon in the Middle Basin, it is midnight in the Great Basin of North America. Can you tell why?

The western part of the Basin region of Asia is drier than the Great Basin of North America, for the former is much farther from the sea and is also inclosed by higher ranges on the windward sides.

The people in the western part of the Basin region of Asia lead a wretched life. Streams flowing at one time may be dry at another, and river valleys may thus become barren. The people are then forced to roam about in search of pastures for their cattle and sheep. The old towns are sometimes buried by drifting sand.

### 69. The Highland of Tibet.

South of the Basin region rises the great highland of Tibet. Large portions of its plateau[1] surface are nearly half a mile higher than Lake Titicaca, and some of its peaks are twice as high above sea level as the plateau over which they rise. The highlands of Tibet and Bolivia are on almost opposite sides of the earth.

The rainfall of the inner part of the highland of Tibet is very light, owing to high ranges on its southern or windward border. Many of the valleys of Tibet are like those in the Great Basin of North America, but the former are much the higher. They are covered with waste from the inclosing ranges. Streams from the mountains run into the valleys, but there is not enough water to overflow and reach the sea. The lakes and marshes in these inclosed valleys are therefore salt.

Several of the lakes in the western part of the highland of Tibet are the highest in the world, being about 17,000 feet above sea level.

In some places, where the salt lakes or marshes dry away, the surface is covered with layers of white salt. Birds-of-passage often mistake these salty plains for bodies of water and descend to them.

The inner part of Tibet is almost a desert. Owing to its great height it is very cold, except during the days of a short summer season. The soil is poor and there are long periods of drouth. Large herds of wild yaks and musk deer search out grassy places near the streams and on the mountain sides. Few people live in the inner part of Tibet.

Three huge mountain ranges rise above the plateau of Tibet. These are the Kuen-Lun on the north, the Karakoram on the northwest, and the Himalaya on the south.

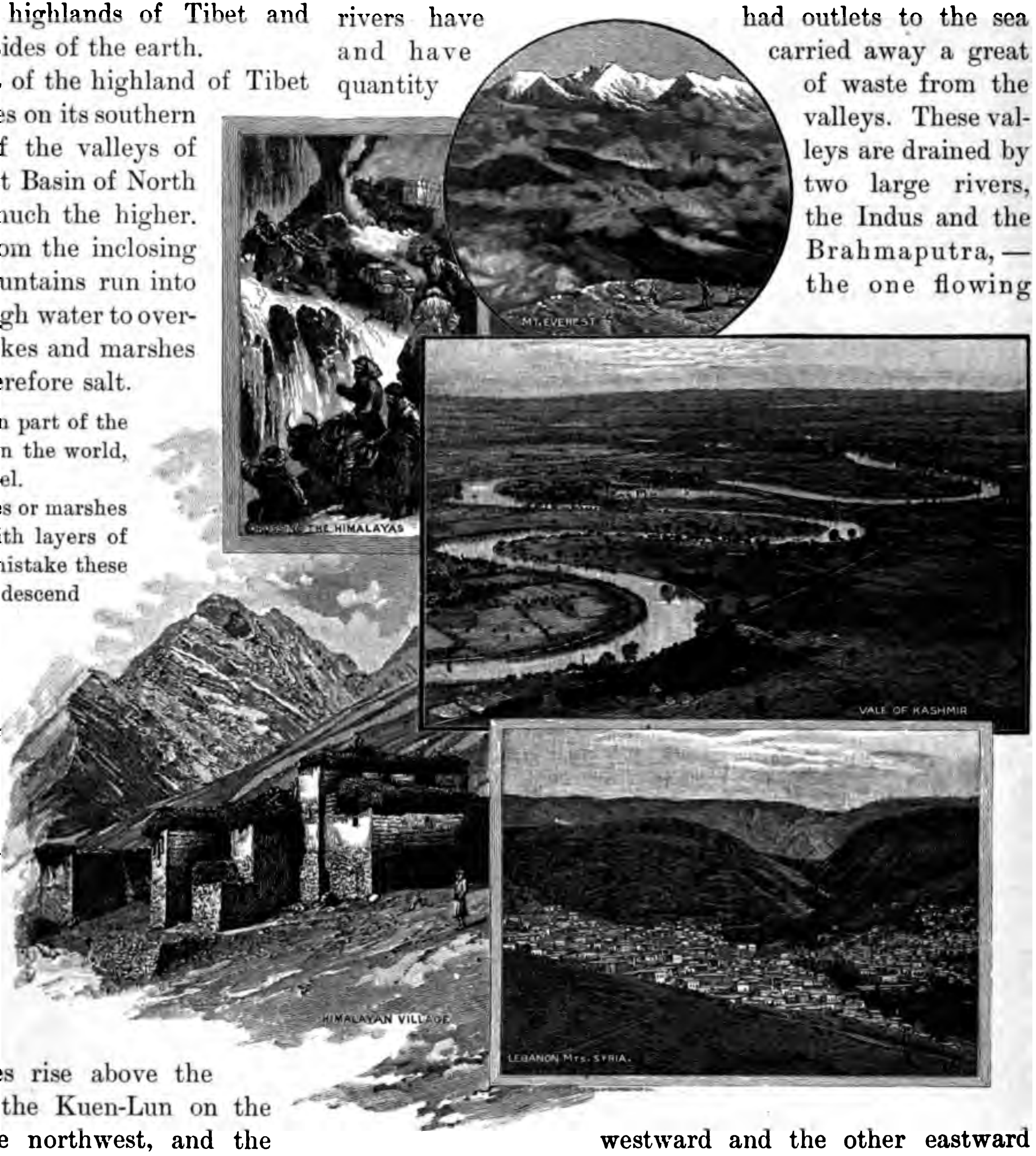
The word *Himalaya* means the *abode of snow*. Even in summer the snow line is about two miles below the highest summits.

Mt. Everest is thought to be the highest peak on the earth. It rises more than five miles and a half above sea level.

The Himalayas are so lofty that they form a barrier to about one half of the air and three fourths of the moisture moving towards them. There is very little moisture in the air above the peak of Mt. Everest.

The effect of such a barrier is very marked. Few of the kinds of plants which thrive south of the Himalayas are found north of the great chain. There is but little food to be found on the lofty slopes, and not many wild animals therefore can travel from one side of the chain to the other.

**The Himalaya mountains separate two races of men, — the yellow people on the north and the white people on the south. Owing to the difficulty of crossing the range, these races have neither traded nor warred to any great extent with each other.**



Just north of the Himalaya chain, the valleys in the plateau of Tibet are deep, because for a long time their rivers have had outlets to the sea and have carried away a great quantity of waste from the valleys. These valleys are drained by two large rivers, the Indus and the Brahmaputra, — the one flowing westward and the other eastward behind the range, and then escaping by deep gorges that they have cut through the mountains.

The upper parts of the Indus and Brahmaputra rivers are fed chiefly by snow melting on the lofty mountains. Along the sides of these streams are found most of the people who live in the highland of Tibet. They have small gardens and herds of yaks. To the natives of Tibet, the yaks are as useful as cattle are to us.[2]

Compared with the Appalachian mountains, the Himalayas are very young. Their slopes are steep and the waste is quickly washed away. Sometimes great landslides take place, — often blocking river valleys and thus forming lakes. When these suddenly break through the barriers, the water sweeps in a flood down the valleys, doing much damage to villages and farms. During the rainy summer seasons, mud avalanches pour down the slopes of many of these mountains. The rock waste has filled some valleys to the depth of from 500 to 1000 feet.

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[1] The average height of the plateau of Tibet is 14,000 or 15,000 feet.

[2] Lesson 114 tells some of the uses of yaks.

The southern slopes of the Himalayas face the moist monsoons from over the Indian ocean and have very heavy rainfall when the southwest trade winds of summer blow.

Khyber Pass.

The Himalaya mountains are in several parallel ranges. The outer or southern ranges are the youngest. Owing to the heavy rainfall, many branches of the Ganges and Indus rivers are so strong that they have held their places and cut their valleys through the younger outer ranges which have been raised across their courses.

The work of these rivers shows how slowly the Himalaya mountains have been formed. While the ranges were being forced upward, the rivers were cutting their channels, and the mountains could not have been raised faster than the streams wore down the solid rock; for the depth of the gorges shows that the streams have held their places for ages. Many of these gorges are so narrow and steep-sided that they cannot be followed. The inner valleys of the highland are generally reached over lofty passes in the ranges.

On the east, the highland of Tibet sends long streams down the slopes of China. Several large rivers from the highland bend also to the southeast. These rivers flow in long valleys between lofty ranges which extend into the peninsulas of southeast Asia. The mountains are heavily forested.

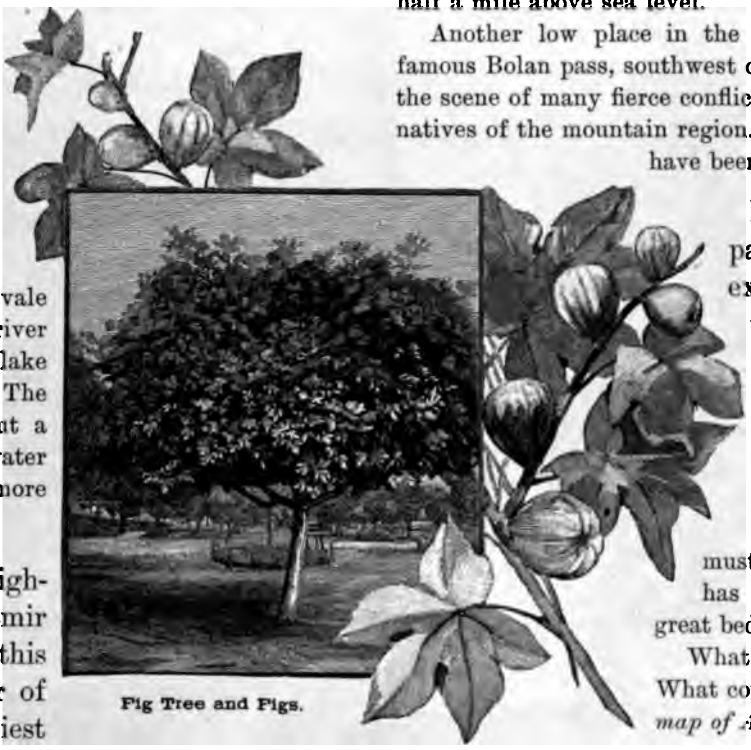


Fig Tree and Figs.

One of the pictures on page 65 shows part of the vale of Kashmir, situated among the Himalayas not far from the place where the Indus river cuts across the chain. The level land of this vale was once the bed of a lake. The river which now meanders across the lake plain is a branch of the Indus. The part shown in the picture is about a mile above sea level, and the water must flow a thousand miles or more before it reaches the sea.

At the western end of the highland of Tibet stand the Pamir plateaus. We may think of this region as the mountain center of Asia. Almost all the loftiest ranges of the continent radiate from the Pamirs.

Eastward stretch the three huge ranges of Tibet. Towards the northeast run the Thian-Shan mountains along the border of the Middle Basin. The Suliman range extends southward to the coast and cuts off India from southwest Asia. The high Hindu-Kush chain stretches westward along the northern border of the plateau of Iran.

## 70. Highlands of Southwest Asia.

The southwest portion of Asia is mostly a plateau region forming part of the great Asian highland.

Where is the plateau of Iran? What mountains are on the northeast? What range is on the east?

The plateau of Iran is about one third as high as the plateau of Tibet. The former is almost inclosed by mountains and is too far west to receive the rainy summer monsoon which blows from the southwest towards the Himalayas.

The plateau of Iran resembles the Great Basin of North America. Both have small streams, salt lakes and salt swamps. In both, the valley troughs are covered with waste from the ranges; in places, sand drifts into dunes; the people settle chiefly near the ranges, where the mountain streams can easily be used to irrigate the land; canals and ditches lead the water over the cultivated districts. As a whole, both regions are dry and unproductive.

In the Suliman range are two important passes over which caravans have gone for centuries. The Khyber pass is one of the chief gateways between the high region of Iran and the low fertile plains south of the Himalaya mountains. This pass is only about half a mile above sea level.

Another low place in the crest of the Suliman range is the famous Bolan pass, southwest of the Khyber. This pass has been the scene of many fierce conflicts between caravan guards and the natives of the mountain region. In recent years the native tribes have been subdued.

Persia occupies the greater part of the plateau of Iran and extends from the Caspian sea to the Arabian sea.

On the plateau of Iran is a region known as the *Persian salt desert.* This covers a large area and consists of solid salt several feet thick in most places. In some parts it is of unknown depth. Centuries must have passed while the water which has now evaporated was depositing this great bed of salt.

What gulf is on the southwest of Persia? What country is west of Persia? *See colored map of Asia.*

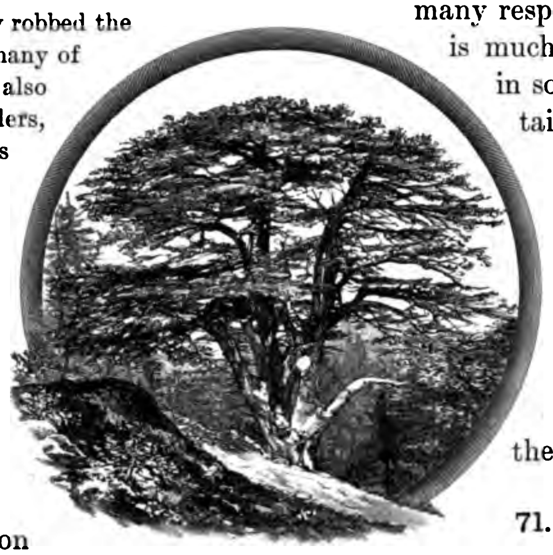
Southwest of the plateau of Iran lies a small river valley sloping to the Persian gulf. The greater part of this valley consists of the flood plains of two rivers, — the Tigris and the Euphrates. Canals have been made to lead water over the plains, and some parts of them are very productive. Wheat is the leading crop. Figs and dates also thrive here.

For many centuries this valley has been peopled by the white race. Under strong rulers, the people thrived and made fine systems of canals to irrigate the land. Then the crops were large, great cities were built, and the nation became prosperous.

For a long time the rulers have been weak. The land has been overrun by thieving tribes that have not only robbed the tillers of the soil, but have also destroyed many of their canals. Fearing these robbers and also having heavy taxes to pay to their cruel rulers, the people have allowed the remaining canals to go to ruin. Many parts of the valley that were once fertile have become sandy and barren.

The Persian gulf is the shallowest of five arms of the sea that almost surround the portion of Asia extending westward from the plateau of Iran. Name the other four seas.

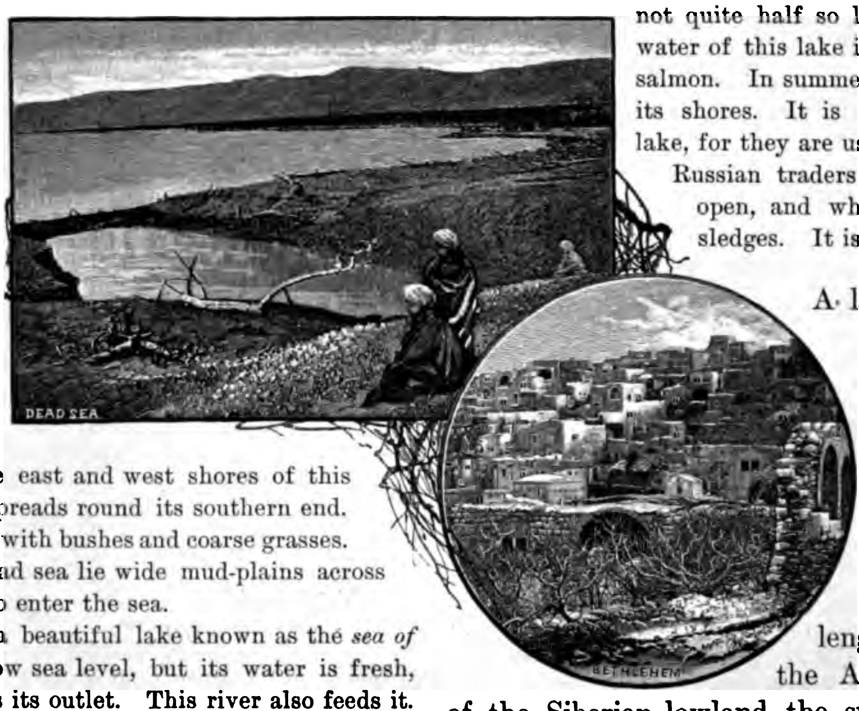
A low plateau spreads out towards these seas. Its average height is about one half that of the Great Basin in our country. A large portion of the region is desert, but there are also many grassy slopes and fruit groves. The land is poorly tilled.


**Cedar of Lebanon.**

Between what seas does the Caucasus mountain range extend?

There are many old lake basins in the region south of the Black sea. These contain small lakes, most of which have no outlets, for there is not now enough rainfall to supply more water than evaporates. Several small rivers flow down the north slope of the plateau. Mt. Ararat, in this plateau region, is a famous volcanic cone a little more than three miles and a fourth high.

Many small but fertile slopes descend from western Asia to the Mediterranean coast. They receive light rainfall from the westerly winds. Figs, olives and grapes in large quantities are raised in that district.



The *Dead sea* is in one of the most famous valleys on the earth. The water of this sea is about ten times as salt as that in the ocean and is also very bitter. The sea is not quite fifty miles long. Its surface is about one fourth of a mile below the level of the ocean.

Steep slopes descend to the east and west shores of this inland sea, but a wide marsh spreads round its southern end. The wet land is thickly covered with bushes and coarse grasses. At the northern end of the Dead sea lie wide mud-plains across which the river Jordan flows to enter the sea.

North of the Dead sea is a beautiful lake known as the *sea of Galilee.* This lake also is below sea level, but its water is fresh, because the river Jordan forms its outlet. This river also feeds it.

The Jordan and the two lakes are in one long valley. It is shut in by high land on both sides. One low range near the southwest shore of the Dead sea contains a deposit of rock salt about six miles in length.

The slopes of the Dead sea valley are mostly barren. Rain seldom falls in this region, except on the mountains. All summer the hot sunshine pours down upon bare and rocky slopes.

The peninsula of Arabia is mostly a desert plateau. In many respects it resembles the Great Basin but is much drier. Dates and wheat are raised in some of the narrow valleys near mountain ranges. Camels and horses also graze there.

Some of these valleys not far from the sea are thickly settled. Until recent years the chiefs have kept travelers out of this part of the country. Many of the chiefs have great wealth and fine buildings.

The hilly slopes near the southern end of the Red sea are famous for their coffee crops.

### 71. The Arctic and Caspian Slopes.

The northern part of Eurasia consists mainly of a broad low coastal plain. The Ural mountains run north and south across the plain and form a portion of the boundary between Asia and Europe. The Arctic lowland in Asia is known as the *plain of Siberia.* Nearly all of this plain is in the basins of three large river systems.

Name three rivers flowing across the plain of Siberia. Where do they rise? Which of these rivers, through one of its branches, receives the overflow of Lake Baikal?

This lake is about one fourth of a mile above sea level and is almost encircled by forested mountain slopes.

Lake Baikal is the largest body of fresh water in Asia, but it is not quite half so large as Lake Superior. The water of this lake is very deep, and it abounds in salmon. In summer many seals are caught along its shores. It is curious to find seals in this lake, for they are usually seen only in the oceans. Russian traders navigate the lake while it is open, and when it freezes they cross it on sledges. It is a useful highway of trade.

A large part of the plain of Siberia lies within the Arctic circle. For two months or more in winter, the greater portion of the Arctic coast of this plain is in darkness. The longest period of summer daylight lasts for an equal length of time. South of the Arctic circle, in all parts of the Siberian lowland, the summer days are long and the winter days are short.

Being far from the equator and far inland from the warmer oceans, the plain of Siberia has long and very cold winters. The summers are short. They are cool in the northern part of the plain, but warm in the southern part.

The map of the heat belts, page 21, shows how far south the cold belt extends in Siberia. There, in the lower part of the Lena basin, is the coldest winter region known in the world. The ground is frozen to the depth of several hundred feet, and even in summer the soil thaws for only a few feet below the surface. The extreme cold is due to the fact that the region is far inland from the warmer oceans, that the winter nights are long, and that warm winds from the far south cannot cross the great central highland.

The average temperature in the coldest part of Siberia is only a few degrees above zero. The winter average is more than 50° below zero; and 90° below have been recorded.[1]

Along the Arctic coast of Siberia are mossy marshy plains called *tundras*. They resemble the marshy plains along the Arctic coast of North America. Heavy floods, like those in the Mackenzie valley, occur in the tundras and for a long distance south of them.

What causes these floods? *See lesson 52.*

In the gravelly river banks of the Siberian tundras, fossil elephants are found. These had woolly coverings that fitted them to live in the cold plains. The "woolly elephants" are unlike any now found on the earth; yet the flesh of these great beasts, after being buried perhaps for many centuries in the frozen ground, is sometimes found well-preserved and is eaten by dogs.

The tusks of these fossil woolly elephants have for a long time supplied part of the ivory so finely carved in China and Japan.

In summer large herds of reindeer visit the tundras to feed on reindeer moss. As the cold season advances, the deer go southward to places where they can find food and daylight. White bears and seals are seen along the Arctic shore, but both the plant and the animal life are scanty. The region is dreary and desolate, except for a few weeks in summer.

South of the tundras, as in North America, lie the forest plains. Most of the trees are cone-bearers, — larch, fir and pine. The forest belt crosses northern Eurasia, from the Pacific ocean to the Atlantic. In Asia the forests extend southward to the border of the desert of Gobi, the Middle Basin and the dry plains around the Caspian sea.

In the Obi basin, east of the Ural mountains, the growth of trees is very dense. There the forested swamps cover many thousand square miles.

Like the rest of the forest belt, the Obi swamps abound in fur-bearing animals. Among these are squirrels, sables, bears and reindeer. Hunters in the Obi swamps must use great care, for large areas consist merely of thickly-woven roots and grasses floating on water. A false step may cost a life.

The forest belt is broken in many places by wide open plains. In the warmer parts of the Siberian river basins, the plains yield harvests of wheat, rye and oats. Even in places where only about three feet of loose soil overlie deeply-frozen subsoil and rock, some grain is raised, but early frosts often destroy the crops.

A railroad is being built from west to east across the plain of Siberia, but at present the great rivers form the main highways of trade and travel. Turn to the relief map on page 62, and you will see that the Obi, Yenisei and Lena rivers branch towards one another in such a manner that, except in two narrow places, there is a water way from the Ural mountains to the Stanovoi range.

In summer many steamers navigate the rivers, and in winter the smoothly-frozen surfaces of the streams make excellent roads. The winter travel is mainly on sledges drawn by deer.

The natives of the Siberian plain belong to the yellow race. Many white people from the great plain in Europe have settled in Siberia, and these now greatly outnumber the natives.

Along the southern border of the forest belt, the open plains, or *steppes*, are covered with fine fertile soil. Large crops of grain are raised, and many cattle, sheep and horses graze on the plains.

The southwest part of the northern plain of Asia is drained towards the Caspian and Aral seas. As the region is low and far inland, it has only light rainfall and is therefore almost treeless. The rain comes in summer when the sea-winds blow over the heated plains. In winter the heavy air tends to flow outward from this region.

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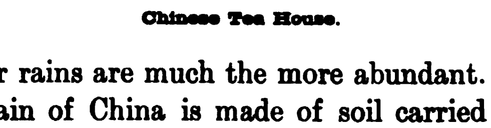
[1] At the trading station of Verkoyansk, 350 feet above sea level. *See map of Asia in the Supplement.*

**The grass in any one part of this region is not plentiful enough to support the cattle and sheep. The people therefore wander with their herds from place to place, living in tents and carrying all their possessions with them. Such wandering people are called *nomads*.**

East of the Caspian sea, the plain is desert-like and barren, except where streams from the mountains are led aside in canals to irrigate the land.



Chinese Tea House.

Yang-tse rivers, are watered partly by
:ains from the summer monsoon and
)artly from winter
torms. The summer rains are much the more abundant.

The great delta plain of China is made of soil carried
.own by the Yellow and Yang-tse rivers, — mostly by the
ɔrmer. This delta plain contains many thousand square miles and is one of the most thickly settled regions in the world.

Above the delta plain, the Yellow river flows through a district covered with deep yellowish soil. This was brought as dust by the

ess Beds, Yellow River Basin, China.

n the dry inland Basin region. The area covered by
far greater than that of the lava plains of the Columbia
ɾion.

ɜ places the yellowish soil, called *loess*, is hundreds of
ɔth. It fills valleys, buries hills and rises far up the
ıountain ranges. Rivers have cut deep valleys in it, and
ɜ of the valleys, at points which the streams no longer
ions of Chinese people have dug caves for homes. This
fertile, and gardens cover a large part of the region.

llow river has carried down countless tons of the yel-
and has made of it the larger part of the great delta
ina. Each year the plain grows farther into the sea, for
.rrent strong enough to carry away the silt sweeps past
ɔf the river. Cities in China that were once seaports
inland.

a plain of the Yellow river, like every other delta plain,
y away on both sides from the muddy river which brings
ıil. Banks have been built along the river to keep it
ır channel. Several times the water has burst through
ınd rushed in floods over the plain. Cities and towns
swept away, and many thousand people have been
The Chinese call the river *China's sorrow*, on account of
ion and suffering it has caused.

ɾflow of the Yellow river has given it a new course
ertile plain and a new mouth about which to deposit
ıd thus build its delta forward. In the course of
e river has shifted its mouth three hundred miles back
ɔng the coast.

ɪw river takes its name from the yellowish soil which
water. This river performs its chief work in making
for it is of little use to steamers entering from the sea.
ın some places is very swift, and numerous bars form,
he mouth of the river, but also far upstream.
ˑer has changed its course, and as it is hardly navigable, only a few large cities have grown up along its banks.

The Yang-tse river has built the southern part of the great delta plain of China. This stream forms the best water way on the eastern slope of Asia, and is open to large steamers for more than a thousand miles from the ocean. Many of the greatest cities in China have grown up on the banks of the Yang-tse river.

Above the delta plain, for a long distance inland, the basins of the Yellow and Yang-tse rivers are rolling or

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# The Boundaries of Ecuador.

As stated on page 108 of the Natural Advanced Geography, the boundaries of few of the South American republics are definitely settled. This is particularly true of Ecuador. Along her northern border is a wild, forest-covered region embracing about 100,000 square miles that is claimed by both Ecuador and Colombia; and on the southern border a region nearly half as large is claimed by both Ecuador and Peru. Between these border lands claimed by her more progressive and powerful neighbors there remains in the actual possession of Ecuador only a triangular wedge-shaped tract with an area of about 117,000 square miles.

No boundary treaties having been mutually ratified between Ecuador and either of her neighbors, the maps issued by Ecuadorian authorities naturally include in that country all of the disputed territory, which gives to the republic the shape of an irregular trapezoid about 750 miles long, with an average width of about 330 miles, and an area of ($750 \times 330 =$) 247.500 square miles. On the other hand the maps issued by Colombia and Peru include the territory claimed by those republics, thus cutting Ecuador down to the triangular wedge having a base in the west of about 450 miles, and its apex in the east about 520 miles from the Pacific, and having an area of about ($\frac{450 \times 520}{2} =$) 117,000 square miles.

It thus happens that Atlases, Encyclopedias, and School Geographies differ among themselves respecting the shape and size of Ecuador: some reproducing the Ecuadorian claims and giving the country the shape of a large trapezoid winters. The summers are short. They are cool in the northern part of the plain, but warm in the southern part.

The map of the heat belts, page 21, shows how far south the cold belt extends in Siberia. There, in the lower part of the Lena basin, is the coldest winter region known in the world. The ground is frozen to the depth of several hundred feet, and even in summer the soil thaws for only a few feet below the surface. The extreme cold is due to the fact that the region is far inland from the warmer oceans, that the winter nights are long, and that warm winds from the far south cannot cross the great central highland.

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[1] At the trading station of Verkoyansk, 350 feet above sea level. *See map of Asia in the Supplement.*

hilly. The western portions of the great basins are in the mountainous regions of Tibet.

The leading exports from China are tea and silk. Rice and a grain called *millet* are among the chief food products.

The tea plant is hardy, but it grows best in a hot, moist and even climate. It needs a great deal of rain, yet the plant dies if placed in swampy land.

A Chinese Junk.

Several times a year, crops of leaves are picked for curing. Care is taken to nip off the leaves without injuring the buds which grow where the leaves join the branches. The youngest and earliest leaves are the most delicate and give the best-flavored tea.

The green leaves which are to be cured and sold as black tea are first spread on trays to dry. The leaves are then roasted for a few minutes and afterwards rolled between the hands to press out the juices. As the leaves dry, they turn black and are then ready for use.

The green and the black teas are made from the same kind of leaves, but for green tea the process of drying is completed as rapidly as possible after picking. About four pounds of fresh leaves are needed for each pound of tea.

Silk is made of fibers spun by silkworms. These little creatures feed on the leaves of mulberry trees.

Each worm makes a silken case, or *cocoon*, by spinning fine long threads and winding them around its body. Some of the cocoons contain more than two miles of silky fiber, and yet they are only about as large as robins' eggs.

Trained Elephants, India.

The cocoons are put into hot water to kill the silkworms; otherwise they would gnaw their way out, spoil the cocoons and fly away as moths. The fiber is unwound from the cocoons and is made into thread or cloth.

Southeast Asia and the adjacent islands are famous for their fine silks.

Hongkong and Shanghai have a large trade in tea and silks.

Canals extend almost the whole width of the great delta plain of China and form fine water ways. They supply water also for large tracts of land on which rice and other products are raised. A large inland trade is carried on by way of these canals and rivers.

More than two thousand years ago, a high and wide wall was built along the former boundary of China, to shut out fierce Tartar tribes on the north. The wall runs for more than a thousand miles over mountains and through wide valleys. Many parts of the great wall are now crumbling to ruins.

China contains about one fourth of the people in the world. The Chinese belong to the yellow race.

From the Tibetan highland long mountain ranges extend into the great peninsula of Indo-China. Swift streams flow in the valleys between these ranges. The longest of the streams is the Mekong river.

The course of the Mekong is in many places broken by rapids. The river is therefore not open to navigation, except for about three hundred miles from its mouth. The Mekong is building a delta plain, but it is not nearly so large as the delta plain of the Yellow river.

### 73. India.

The great country of India is bordered on the north by the Himalayas. In the south it contains the plateau of the Deccan in the large V-shaped peninsula. Between the Himalayas and the Deccan are broad river plains.

India is in the path of the monsoons. In the hot season these winds blow from the sea to the land; in the colder season they blow from the land to the sea.

In the Indian ocean north of the equator, not only the winds but the currents also flow back and forth as the seasons change. Soon after the wind alters its direction, it turns back the ocean current, and both flow together till the monsoon again shifts with the season.

The Himalaya mountains form the greatest rain and snow producer in the path of the summer monsoons from over the Indian ocean. Both the northern and the southern slopes of this range are drained by rivers that flow into the low plains of India.

The largest annual rainfall in any part of the world is supposed to be at the town of Cherrapunji, in the mountains about two hundred miles north of the bay of Bengal. This town is a little more than 4000 feet above sea level and is walled in on the north by steep ranges rising 2000 feet higher.

The moist monsoon from the sea ascends more than a mile before it surmounts the ranges. In rising over them, the air expands, cools and gives down from 400 to 600 inches of rain each year upon the town.

The snows of the Himalayas are increased by winter storms which drift eastward, like those of the westerly winds elsewhere. The northern plains of India often receive light rains in the same season. This fact seems to show that in winter, the belt of westerly winds reaches far enough south to influence the climate of northern India, both in the mountains and in the plains.

To avoid the extreme heat of the plains, many Europeans living in northern India spend the hot season on the "hills," or low ranges along the southern border of the Himalayas.

Below the snow line, forests cover the southern slopes of the Himalayas. Near the foot of the range, trees, vines, bushes and grasses form dense jungles in which tigers, elephants, rhinoceroses and other huge beasts are found. One of the pictures on page 68 shows some of the tree ferns of that region. ***See pictures, p. 117.***

Above the wet jungles is a belt of hard-wood trees, — oak and walnut. Still higher, the mountain slope is covered with rhododendron shrubs with their acres and acres of large showy blossoms.[1] Between these and the snow line stands the belt of soft-wood or cone-bearing trees.

Most of the rivers of the plain of India are included in three systems, — the Indus on the west, the Brahmaputra on the east, and the Ganges in the middle part.

These three river basins are in the warm belt and also in the path of the moist southwest monsoons. The climate is therefore hot or warm most of the year. The heavy rains fall while the summer monsoon lasts. The dry season occurs when the winds blow from the land to the sea. *See maps on page 24.*

A Hindu.

All along the foot of the Himalayas, as of other high ranges, cool evening breezes flow from the mountain valleys and enter the warmer lowland. These winds last far into the night and greatly lessen the sultry heat.

The upper portion of the Indus lowland, near the foot of the Himalayas, is well watered and is the richest wheat region in India. The lower part of this river basin is a desert.

Large sand bars form shoals in the bed of the Indus river. Navigation is therefore difficult, but steamers succeed in going up the river as far as the wheat country.

State Elephant, India.

The plain of northern India, like that of the valley of California, is formed of land waste brought by the rivers from the mountains. Many branches of the Ganges river rise in the southern slope of the Himalayas. So much waste in the form of alluvial fans (*see page 8*) has been washed from the slopes of this range, that the Ganges river has been pushed far southward towards the Deccan. Near the mountains the coarse waste forms steep slopes, but far out in the valley the fine waste forms very gentle slopes.

A Zebu Cart, Ceylon.

On the lowland, the divide between the Indus and Ganges basins is formed where the plain built by the rivers is a little higher than on either side, east or west.

Near the base of the mountains, the gravels are moist with ground water and are covered with forests; but the greater part of the plain has no forests, and over much of the surface there are few trees, except in irrigated gardens.

The Ganges system has built very large flood plains, sloping only a few inches to the mile. In the rainy season, these plains are flooded far and wide, thus receiving fresh soil from the highland slopes. The Ganges and Brahmaputra rivers unite in making a large delta plain crossed by a great network of distributaries.

The plains of the Ganges basin are carefully irrigated by means of canals and ditches leading from the rivers. The rainfall of the summer season is thus made to serve for the entire year, often through long periods of drouth.

Before India became a British possession, suffering from famines was common whenever the rains came late or in small quantity. There is not so much suffering now, because the English people have improved the canals and have also built railroads which can quickly carry supplies to famine-stricken provinces.

Rice is the leading crop in the delta lands and in the lower parts of the flood plains. Farther inland, *millet* is the chief product and is the staple food in nearly all parts of India. Cotton is the most valuable article of export from the Ganges plain.

The Ganges river is navigable for more than a thousand miles through its great flood plains, and is alive with boats carrying products from place to place.

In summer, violent thunderstorms occur in the Ganges plain. Squalls precede these storms and fill the air with dust. Then follow the clouds with lightning and rain, and all go sweeping down the plain.

Destructive cyclones, or violent whirling storms, are common in the great delta plain of the Ganges and Brahmaputra rivers. The winds sometimes drive the sea-water onto the low delta lands, forming storm floods in which thousands of people are drowned.

The Brahmaputra river, like the Indus, flows in a deep inland valley on the north flank of the Himalaya range. Cutting through the eastern part of the range, the Brahmaputra crosses the low plain of northeast India and joins its delta with that of the Ganges river. This great double delta is slowly growing southward into the bay of Bengal.

Cart drawn by Zebus, India.

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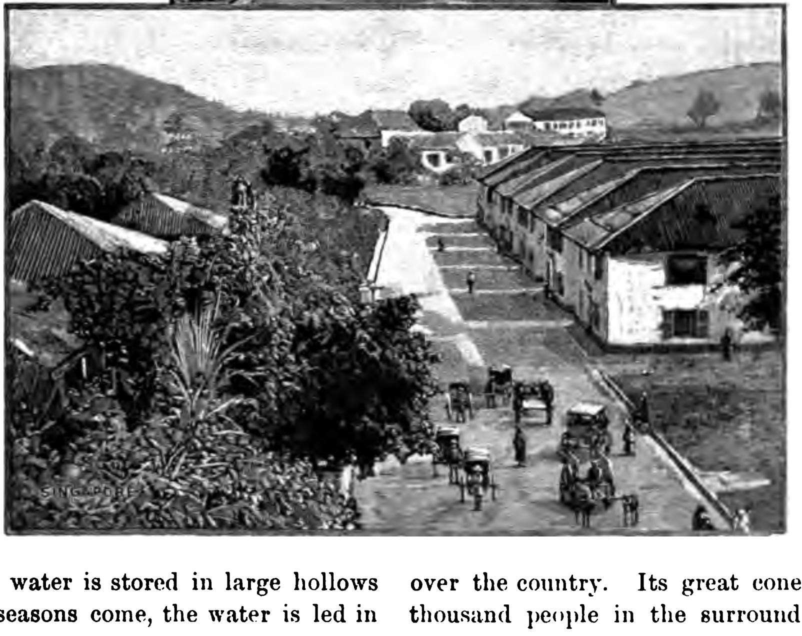
[1] The flowering shrubs in the picture of Mt. Mitchell, on page 42, are rhododendrons. They often cover thousands of acres.

The *teak* tree abounds in India and in the large peninsula of Indo-China still farther east. When the wood of the teak has been thoroughly dried, it will not shrink, warp nor crack, even under the tropical sun. This wood is very strong, is easily carved, and takes a fine polish. These qualities make it very valuable.

DYAKS OF BORNEO

STREET IN JAVA

WEAVING IN JAVA


SINGAPORE

The lowlands of northern India, except the desert region of the lower Indus, are densely peopled. These lowlands, together with the V-shaped peninsula on the south, support about one fifth of the people in the world. Most of the natives are called *Hindus*. They belong to the white race.

Ages ago the people now known as Hindus moved into India, probably from some part of central Asia, and conquered the native tribes. Many of the descendants of these natives are now found in the hilly or mountainous regions of India. Highlands are often a place of refuge for man, as well as for the lower animals.

Southward from the Ganges basin extends the great V-shaped peninsula of the *Deccan*. This is mostly a low plateau region, about equal in height to the Appalachian highland. The peninsula has low ranges facing the sea on both sides and is partly separated from the rest of India by a hilly range on the north. Within the triangle thus formed, about 100,000,000 people have made their homes, — many more than dwell in our entire country.

The Deccan is highest on the west side, and its main streams therefore flow eastward into the bay of Bengal. The Western Ghats rise abruptly from a narrow coastal plain. The steep western slope is in the path of the southwest monsoon, and therefore receives very heavy summer rainfall. The rains of the inland plateau east of the Western Ghats are not so heavy. Can you tell why?

During the wet season the rain water is stored in large hollows or reservoirs; then when the dry seasons come, the water is led in ditches over the lower tilled land.

The lava-flows of the Deccan peninsula have been fully as great as those in and around the Columbia plateau. In each case the molten rock covered many thousand square miles. The Deccan lava-flows are much the older and the more deeply cut by valleys. The surface is finely weathered, making dark soil that is very fertile. The middle picture on page 14 shows part of this plateau.

The portion of the Deccan that is not buried in lava is mostly an old mountain region greatly worn down. Gold is found in the stumps of the old mountains.

The rivers which flow eastward across this peninsula have made flood plains and deltas of wonderful fertility. For ages these lowlands have yielded immense crops of rice. All over the peninsula, except on the rugged mountain slopes, cotton and grain are raised. There, as in northern India, millet is the chief article of food among the masses of poor people. Cocoanuts are a leading product. *See picture on page 97.*

The island of Ceylon, off the southern coast of India, is very fertile and yields about the same kinds of products as the adjacent mainland. A great deal of cinnamon bark is exported from this island.

Railroads lead from nearly all parts of India to the port of Bombay on the west coast, to Calcutta in the Ganges delta, and to Madras on the southeast coast. These are the chief ports through which the cotton, rice and other products are sent to foreign countries, and through which clothing and tools are received in return.

## 74. Asiatic Islands.

Long curving chains of islands lie east and southeast of Asia and partly inclose large border seas. These islands contain hundreds of volcanoes, many of which are now active.

Fusiyama, in Japan, is the most noted of these volcanoes. Its cone rises about two miles and a half above sea level, and its crater is very deep. Fusiyama is not now active, but nearly two hundred years ago it burst forth and sent a heavy shower of ashes far and wide over the country. Its great cone was cracked and split. Many thousand people in the surrounding country were killed during the eruption.

To the people of Japan, Fusiyama is a sacred mountain, and many pilgrims ascend it each summer.

The large islands in the Japan group consist mainly of old volcanic hilly country, but there are also many wide plains. Tea, grain and the mulberry tree are raised in the uplands, while nearly all the lowlands are used for rice fields. Two crops of rice are taken from the fields each year.

A coarse grass-like plant called *bamboo* grows in Japan, as well as in most parts of southeast Asia and the border islands. Bamboo is also found in other warm lands. The hollow jointed stems grow to the height of forty or fifty feet, but some stems are more than seventy feet high.

Houses and boats are made of bamboo stems. The seeds and tender shoots are served as food, on dishes formed from the joints of the stalks. The softer parts of the stalks are beaten into pulp and are used in making paper. Strips of bamboo are made into baskets, chairs, beds and various other articles.

Banyan Tree.

Bamboo.

The rivers of Japan, though short, are useful for floating logs of cedar and pine from the hilly districts to the sawmills near the coast. Large flat-bottomed boats on these streams carry produce down to the ports.

Fusiyama, Japan.

The people of Japan belong to the yellow race. Their number is more than half as great as that of our own nation. Yokohama is the chief port through which foreign nations trade with the Japanese. Silk, tea and rice are important exports.

Java, Sumatra, Borneo, Celebes, the Philippine and many other islands southeast of Asia are often called the *East Indies*.

Thousands of years ago these islands were probably connected with the mainland. The seas around them are shallow, and the broken coastlines formed by the drowning of valleys show that the land has settled. Moreover many of the same kinds of large animals are found both on the mainland and on the large border islands, but not beyond the deeper water which separates these islands from those nearer Australia.

Locate Java on the *key map*, page 91. In what direction is it from Borneo? From Sumatra? From Australia? From the mainland of Asia? What rain belt crosses Java, Borneo and Sumatra?

The groups of islands in the East Indies have a hot climate and abundant rainfall. Their soil is therefore very productive. Sugar, coffee, tea, spices and rice in large quantities are raised on these islands, but chiefly in Java.

The *banyan* tree is found in some parts of the East Indies and on the mainland of southeast Asia. The branches of this tree send down shoots that take root in the ground. These shoots also branch and the new branches send down other shoots. A single tree may thus spread and form a grove covering several acres.

Java is the most productive and the most densely populated island of the East Indies. This one small island supports a population equal to one third that of the United States.

Most of the people in the East Indies belong to the brown race. Many white people from Europe have settled along the coasts of the islands, especially in the seaports. Nearly all the islands are claimed by nations in Europe.

Mikado's Palace, Japan.

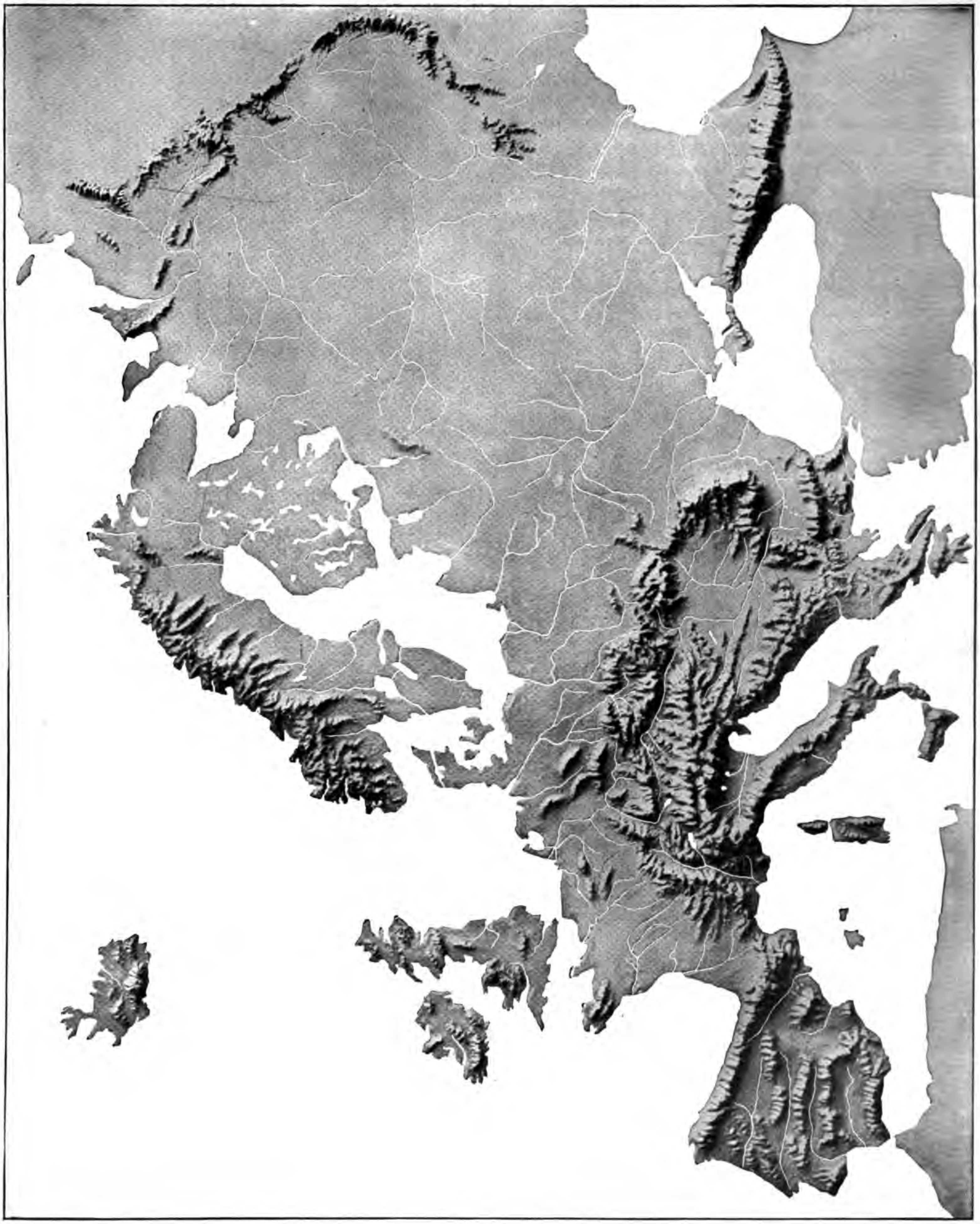
Sumatra consists mainly of a mountain region along its southwest coast, and broad lowlands stretching from this highland to the northeast coast. The rivers which cross this lowland are building great deltas. Coffee and sugar are valuable exports.

Borneo is one of the largest islands in the world. Its area is equal to nearly one tenth that of the United States, exclusive of Alaska. This great island has a central plateau from which several ranges branch into the coastal lowland.

Among the Malay people of Borneo are many tribes of Dyaks. These are thought to be descendants of the earliest natives. The Dyaks build houses or huts of bamboo, as shown in the picture on the opposite page. These natives weave cloth and make iron tools. Among the large animals of Borneo are the wild ox and the orang-outan, a man-like ape. There are also many wild pigs.

The Philippine group consists of more than 1000 islands. In the more rugged portions of these islands are found thousands of dwarf people called *Negritos.* The more fertile lands are held by Malay people who have driven off the Negritos. There are also many Chinese and some white settlers,—the latter being Spaniards, for the islands are held by Spain. Rice is the staple food of the people.

Large quantities of sugar, hemp and tobacco are raised on these islands and are the most valuable exports from Manilla, the chief seaport.



RELIEF MAP OF EUROPE.

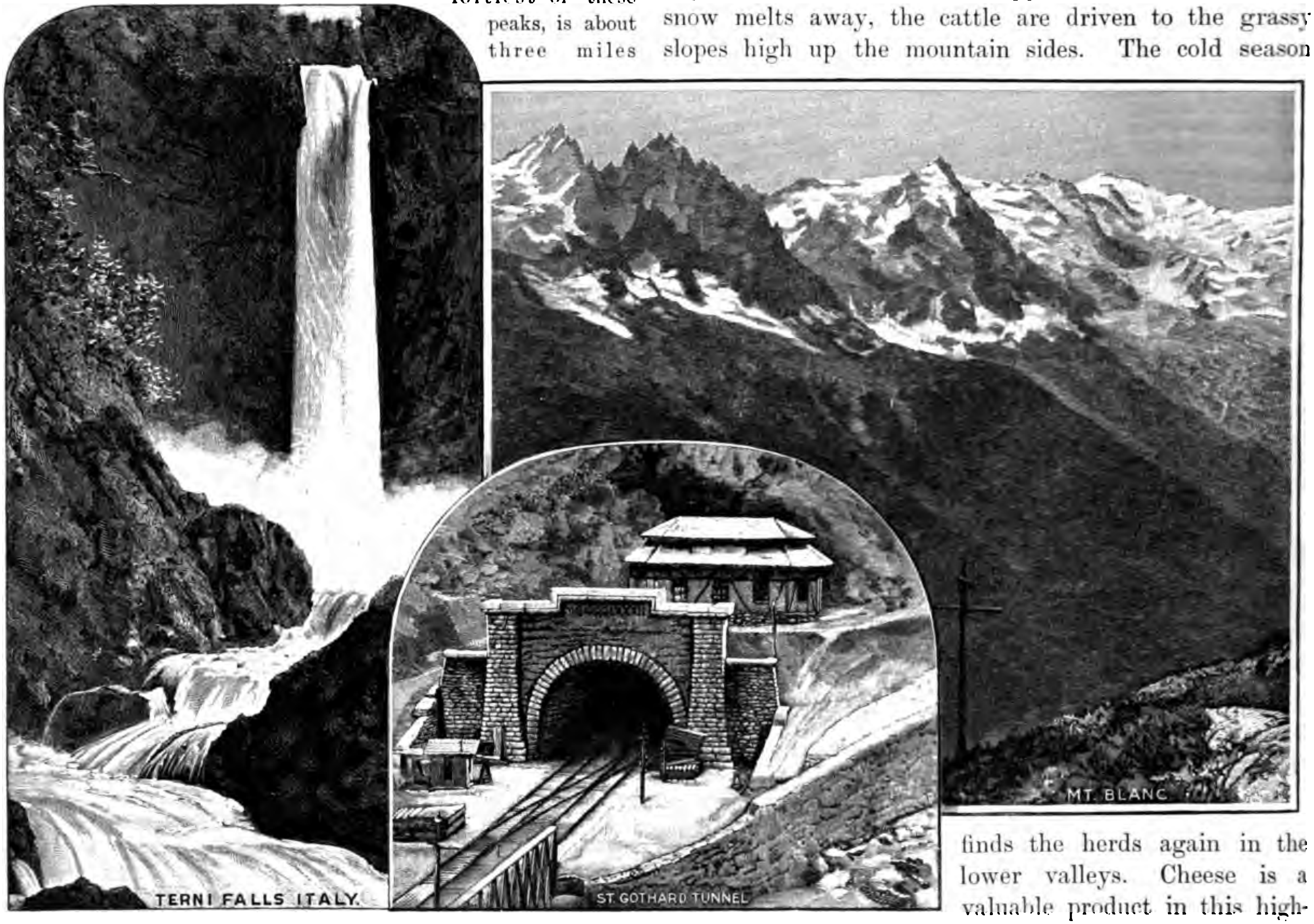
## 77. Region of the Alps.

The outlet of the Black sea separates the plateau region of southwest Asia from a chain of highlands stretching westward to the Atlantic coast. The Alps which form the mountain-center of southwest Europe are about as high as the Rocky mountains in the park region.

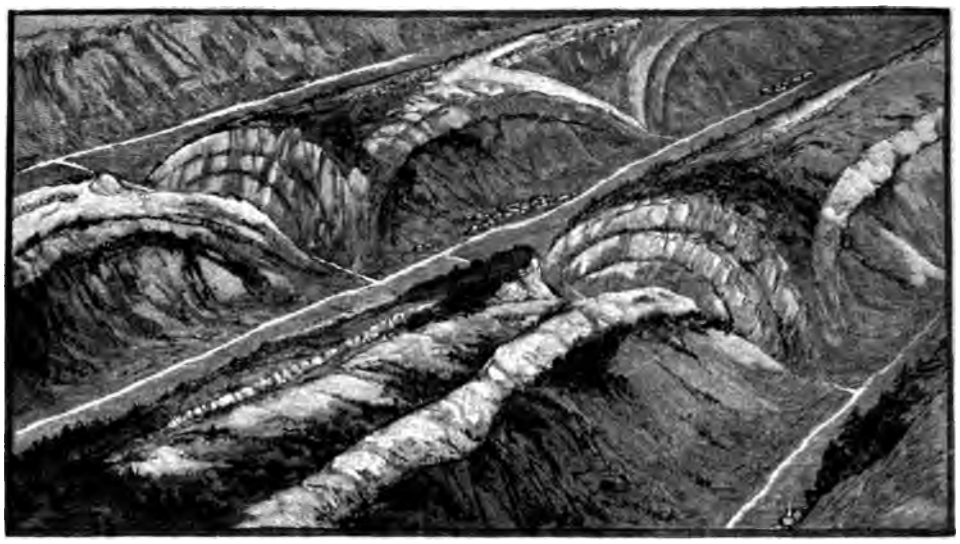
The Alps have many sharp peaks, for they are too young to be greatly worn down. They are not nearly so old as the Appalachian highland. Slight earthquake shocks are frequent in the Alps and are taken to mean that the mountains are still growing higher.

As in other young and steep-sided mountains, there have been many snowslides and landslides in the Alps. Villages have thus been destroyed and many people killed. Violent blasts of wind are brushed down by large snowslides and advance even beyond the snow, blowing down trees and houses.

Among the Alps are great snow-capped peaks down whose sides long glaciers slowly wind, melting in the valleys. Mt. Blanc, the loftiest of these peaks, is about three miles high,--a little higher than Mt. Whitney in the Sierra Nevada. The snow-cap on Mt. Blanc reaches halfway down its sides.



The Alps are pierced by several railroad tunnels. The St. Gothard tunnel is nearly ten miles long,--the longest in the world. It connects the Swiss plateau with the basin of the Po river. Mt. Cenis tunnel is near the western end of the Po basin.



Ridges and Troughs of the Jura Region.

Beautiful lakes abound near the margins of the Alps. The Rhone river flows into and out of Lake Geneva, while the waters of Lake Lucerne find their outlet in a branch of the river Rhine.

Thousands of cattle graze in the valleys among the Alps. As the warm season approaches and the winter snow melts away, the cattle are driven to the grassy slopes high up the mountain sides. The cold season finds the herds again in the lower valleys. Cheese is a valuable product in this highland region and is a leading article of export.

There is very little coal in the Swiss plateau, but swift streams supply plenty of power for the mills and factories. The Swiss people weave large quantities of silk and cotton goods, and make many fine watches.

Some of the buildings made by the Moors may still be seen in the Spanish peninsula. Grandest of all is the *Alhambra,* — the palace and fortress of the Moorish kings. It is in the city of Granada. This was the last stronghold of the Moors in Spain, and was captured the year that Columbus first set sail for the New World. *See map of Europe in the Supplement.*

The Alhambra, — Moorish Palace, Spain.

A few hundred thousand people known as *Basques* live in the Cantabrian mountains of northwest Spain. The Basques are the remnant of early tribes that once held the Spanish peninsula. These mountains, like many others in the world, are a place of refuge for the descendants of a conquered people. The Basques are mostly shepherds.

The Spanish peninsula consists mainly of broad table-lands, with a border of narrow coastal plains on the east and the west. Mountain ranges almost inclose the upland region, and other ranges extend across it. The general level is about half a mile above the sea. This broad upland surface is swept by chilly winter winds and is parched by summer sunshine. Only the spring and autumn months are mild. The rainfall is so light that the plateaus are almost treeless.

Spanish Milkman.

In what direction do the principal mountain ranges in the Spanish peninsula extend? Where is the Sierra Nevada of Spain?

Describe the courses of the Ebro and Guadalquivir rivers.

The river valleys in this peninsula are fertile. Those of the Ebro and Guadalquivir rivers form the broadest lowlands, but even these are not very broad. The narrow coastal plains also are fertile. Those on the west and southwest coasts receive heavy rainfall; those on the east are well irrigated from immense reservoirs in the uplands.[1] Wheat and barley are the chief grain crops, but the peninsula is noted for its vineyards and orange groves. Wine is the chief article of export.

On the southern coast of Spain, near the strait of Gibraltar, a small but famous peninsula extends into the sea. The body of the peninsula consists of a mass of rock about two miles and a half long, known as the *Rock of Gibraltar.* This Rock was once an island, but sandy waste filled in the strait at its northern end, and now a flat neck unites the Rock with the mainland.

Gibraltar is a fortress belonging to the British nation. The north and east sides of the huge Rock are very steep, but the west side has a more gentle grade, and a town has been built at its foot. This side is also strongly fortified by immense walls and galleries, most of which are heavily armed with cannon.

### 79. The Po and the Apennines.

Following the Mediterranean coast from Spain to Italy, we pass *Monaco,* the smallest state in Europe. The total area of the state is only about eight square miles. It is near the southeast corner of France. The city of Monaco, in the state of the same name, occupies a rocky headland, as shown in the picture.

The Po river flows through a plain that is not many feet above sea level. This plain is made of waste worn from the Alps and the Apennines. The lowland consists of flood and delta plains.

The melting snow and ice in the high Alps feed many of the Po branches. One of these flows from a glacier on Mont Blanc.

Along the northern border of the plain, near the foot of the Alps, are some of the Alpine lakes that are famous for their beauty. Among these are Como, Garda and Maggiore. These lakes lie in places where the country seems to have been bent down, changing parts of the river valleys into basins. Former glacial action has aided in scouring out the lake basins, and much waste brought down by the ice still lies in heaps, or moraines, around the foot of the lakes.

Monaco.

The Adige river drains part of this lowland but does not join the Po. The floods of these rivers are so dangerous that long banks, or dykes, have been built to confine the water. As the streams continue to fill their channels with waste from the mountains, the dykes are built higher. In some places the surfaces of the rivers are now higher than the plain.

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[1] Many of the reservoirs were built centuries ago by the Moors.

The streams flowing from lakes into this lowland are clear, but those coming directly from the mountains carry sand and finer rock waste, and are building up the plain.

The marshy deltas of the Po and the Adige are rapidly growing into the Adriatic sea. Some places that were once seaports are now several miles inland. Along the coast, sandy islands almost inclose lagoons.

The city of Venice is built on islands in one of these lagoons. In this city, canals partly take the place of streets. Boats called *gondolas* are seen everywhere on the canals.

Venetian Gondolier.

Irrigating canals reach almost every part of the valley of the Po and the Adige, making it one large garden. Grains of all kinds thrive there, and the foothills are covered with vineyards. The meadows are mowed five or six times a year, — yielding fine grass for dairy cattle. Mulberry trees abound.

Milan, the largest city in the Po valley, is a great railroad center and therefore a distributing point for exports and imports.

Railroads from this city lead through the St. Gothard and Mt. Cenis tunnels, about which we read in lesson 77. The St. Bernard pass is one of the most famous passes in the routes over the Alps from the Po valley. Since the building of the railroads, these lofty passes have been little used by travelers.

Pass of St. Bernard.

From the fertile plains in the north, the Apennines extend towards the southeast through the entire length of the peninsula of Italy. This range is older than the Alps and has no such lofty peaks as those rising on the northwest of the Po basin, but the upper parts of the Apennines are buried in snow all winter.

Cold winds from the northeast often sweep over the Apennines, but the foothills and coastal plains southwest of the range are sheltered and produce many kinds of fruit. Among these are oranges, lemons, olives and grapes. This region is also famous for mulberry trees. Silk is the most valuable export from Italy.

Vesuvius.

There are many volcanoes in southern Italy and the neighboring islands, but there is only one *active* volcano on the mainland of Europe. That one is *Vesuvius*, near the bay of Naples, on the southwest coast of Italy.

Many centuries ago the fertile sides of Vesuvius were covered with vines and olive trees. The people who then lived on the slopes of the volcano did not know that their home was near a crater that might at any time pour forth lava and bury them.

There came a time however[1] when a great cloud of steam and dust rose from the crater and spread far out over the land and the sea. Lightning played among the clouds, and showers of ashes fell on the groves, the vineyards and the cities.

For three days the thick dust shut out the sunlight. Bright flashes lit up the clouds, as the gases burst out and blew off the top of the glowing mass of lava. The hot steam changed to rain and mingled with the ashes, making rivers of mud that flowed down the mountain sides, sweeping away the vines and trees and burying the cities. When the eruption ceased, the layers of mud and ashes were so deep that no trace of the houses could be found. Centuries passed and people no longer knew where the cities were buried; but beneath new vineyards and mulberry groves[2] lay many works of art, and the ruins of temples, homes, baths and paved streets. Some of these have now been dug out, and they teach us a great deal about the customs of the Roman people who lived in that early time.

After this terrible eruption, Vesuvius was quiet for about fifteen hundred years. Then it again became active and killed thousands of people. Now and then the volcano breaks forth, but not with such force as in ancient times.

Mt. Etna, on the island of Sicily, is the loftiest volcano in Europe, yet it is only a little more than half as high as Chimborazo.

Italian Piper.

Rome, the most noted of ancient cities, stands on the banks of the Tiber, a small river flowing from the Apennines in middle Italy. About one third of the words in our language are derived from *Latin*, — the language of the ancient Romans.

The beautiful Terni falls, shown in the picture on page 76, are about 70 miles north of Rome. The water in one part of the falls leaps down 330 feet.

Excavations in Pompeii.

On the northeast slope of the Apennines, not far from the source of the Tiber, lies the small free state of San Marino. The state covers only thirty-two square miles and has a population of about 8000;

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[1] The eruption took place in 79 A.D. The cities of Pompeii, Herculaneum and Stabiæ were buried.

[2] The eggs of the silkworm were first carried from China to Europe about 550 A.D., — nearly five centuries after the great eruption.

but small as it is, San Marino is a very old state. Most of the people in this small state tend cattle or raise wine grapes.

The leaning tower shown in the picture is in *Pisa*, a city on the Arno river, Italy. Two thousand years ago, Pisa was only two miles from the mouth of the Arno; now it is six miles, for the river has meanwhile built its delta out into the sea.

The famous leaning tower is 183 feet high, and it leans 13 feet from an upright position. The walls of the tower are very thick and are made of marble.

San Marino.

## 80. The Balkan Peninsula.

Many ranges branch from the eastern end of the Alps. Some of these turn towards the southeast and divide into smaller ranges forming the highland in the Balkan peninsula. This broad peninsula stretches from the Black sea to the Adriatic.

The Balkan range is the highest in the peninsula. These mountains extend east and west along the southern border of the Danube basin.

Apollo Belvedere.

Forests of pine and oak grow on the Balkan slopes and in other parts of the rugged highland of this peninsula. Thousands of swine feed on the acorns. The roses which thrive near the Balkan range yield a perfume known as *attar of roses*.

Leaning Tower of Pisa.

The lowlands in the Balkan peninsula are very fertile. More than one half the land is arable, or fit for plowing. The hilly portions afford good pastures.

The middle belt of the Balkan peninsula is occupied by Turkey. Owing to the poor way in which the country is governed, the people are shiftless and do not make good use of their land. Wheat, raisins and tobacco are valuable products. Constantinople, on the strait called the *Bosporus*, is the chief port of Turkey.

The Pindus mountains are low, but they run like a backbone through the southern part of the peninsula. There, in the small country of Greece, many deep and broad valleys lie between the branches of this range.

The Bosporus.

On the plain of Marathon, shown in the picture on page 77, the ancient Greeks won a great victory over a large army of Persians. This plain lies between the mountains and the sea. Most of the mountains in Greece are small and greatly worn, like those which overlook the plain of Marathon.

The broken coastline of Greece, and the many bordering islands, show that this land has been partly drowned. Most of these islands are spurs from the Pindus range, not wholly covered by water. Some of the islands are of volcanic origin.

The southern part of Greece is a peninsula having a very narrow neck known as the ***isthmus of Corinth.*** A ship canal has been cut through this isthmus. The small raisins of Greece are called *currants*, — a corruption of the word *Corinth.* Currants are the most valuable product which Greece sends to other countries.

Many years ago the Greeks were famous for their learning and for their works of art. They built grand temples in which they placed beautiful statues made of marble or of ivory and gold. Many of the marble statues and the ruins of some of their temples still exist. The most famous temples were built on a fortified hill known as the *Acropolis*, in Athens.[1]

## 81. The Plain of Hungary.

Where does the Danube river rise? Describe its course. Name a mountain range on the north of the Danube basin. Name a range on the south.

The Carpathian mountains partly divide *High Europe* from *Low Europe*.

The lowland part of the Danube basin which lies southwest of the Carpathian mountains is known as the *plain of Hungary*. This is a young plain which was formerly the bed of a lake. The leading products are sugar beets and grain. The plain of Hungary supports nearly one fourth as many people as there are in the United States. The Danube and its branches form a water way to almost every part of the plain. The main river affords an outlet eastward.

The Acropolis, Athens.

The Danube leaves the plain of Hungary at the place where the inclosing ranges on the eastern side of the old lake basin are lowest. The river has there cut a long gorge across the range. This gorge is known as the *Iron Gate*. *See picture, page 77.*

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[1] On the highest part of this hill stood the *Parthenon*, — grandest of all the temples. Within and without the Parthenon were statues and friezes which rank foremost among ancient sculptures. Many of these are now preserved in the British Museum, in London.

The *Apollo Belvedere*, a copy of a beautiful Greek statue, is now in the Belvedere gallery of the Vatican in Rome.

Iceland and the southern part of Greenland belong to Denmark. Iceland is a volcanic island about 300 miles long. Its middle region is a table-land less than half a mile above sea level and covered with lava and sand. Parts of the island are buried in ice.

Most of the people in Iceland live near the coasts. The chief exports are codfish, wool and eider down. No grains and only a few vegetables are raised on the island. The best-known of the Iceland volcanoes is Mt. Hecla. It has been in eruption several times since the island was settled by the Danes. Volcanic dust from Mt. Hecla has been carried as far as the Scandinavian peninsula. Iceland is remarkable for its geysers, one of which throws a column of water about one hundred feet into the air.

SOGNEFIORD. NORWAY.

### 83. The British Isles.

Two large islands and many smaller ones form the group known as the British Isles. Largest of these is Great Britain, the most important island in the world, yet it is only one fortieth as large as the United States. Ireland is second in size among the British Isles.

The British Isles are at about the same distance as the Labrador peninsula from the equator, but the islands enjoy a mild climate and even seasons, while the peninsula has low temperature with severe seasons. A great branch of the North Atlantic eddy drifts past the coast of the British Isles and tempers the westerly winds which prevail there. The westerly winds over Labrador bring great changes of heat and cold from the interior of North America.

Jaunting Car, Ireland.

The slopes of the British Isles which face the Atlantic receive of course the heaviest rainfall from the westerly winds, but all parts of the islands are well watered.

Most of the high land in Great Britain is in the north and west parts. There the rocky coast, like that of western Scandinavia, is broken by many fiords and fringed with small islands. The south and east parts of the island are mostly lowland, with clayey or sandy shores.

The island of Great Britain is in three divisions. What range of hills separates Scotland from England? Where is Wales?

The northern portion of Scotland is very rugged, but it contains no lofty chain like the Alps.

The Scottish highlands consist mainly of lofty uplands and long narrow valleys. Some of the uplands are flat-topped, like those of the Scandinavian highland.

Ben-Nevis is the highest point of land in the British Isles. It is a rounded mountain, not quite two thirds so high as Mt. Mitchell.

On the summit of Ben-Nevis there is a weather observatory where winds and clouds are constantly observed. Much has thus been learned about the upper air currents from over the North Atlantic ocean. This is one of the few high-level observatories in the world.

Many of the streams in the Highland glens spread into beautiful lakes, or *lochs*. These may be counted by hundreds. They were formed by glacial action, like the lakes in the northeast part of our country.

The cattle and sheep of the Scottish highland take high rank in quality. This region is so rugged that it is thinly peopled. The Highlanders are mostly descendants from a race of brave people that were long ago driven from the lowlands by invaders from the mainland of Europe.

Culloden Monument.[1]

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[1] This monument at Culloden marks the site of the battle which decided the fate of the house of Stuart, a royal family in Scotland.

Southward from the Scottish highlands spread the rolling or hilly lowlands of a fine farming district. Under many of the farms are mines of iron ore and of coal.

Scotch Highlander.

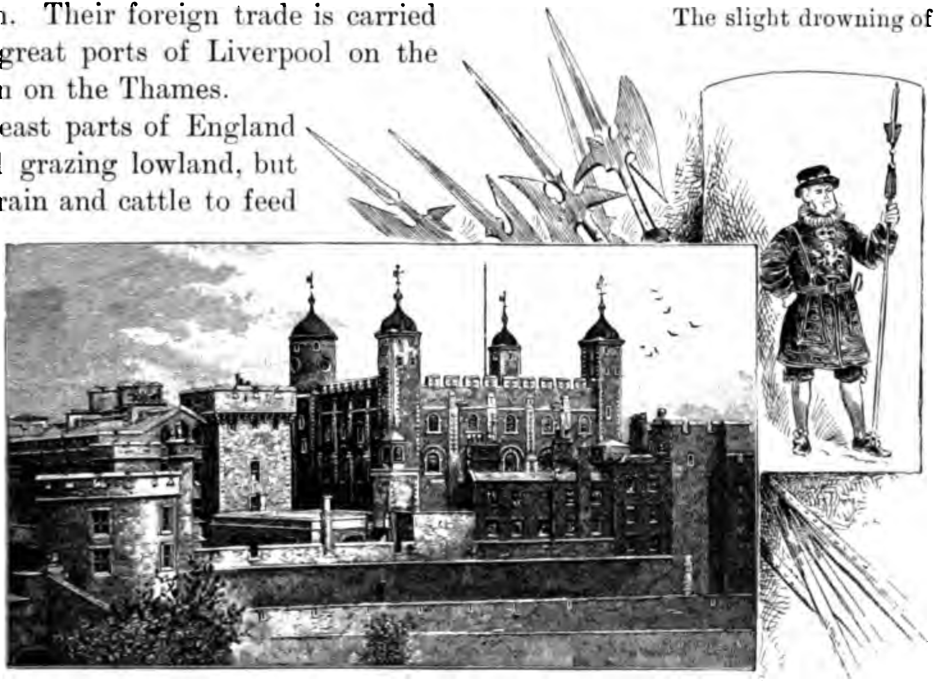
Where is the Clyde river? A rich farming and mining belt crosses the Clyde basin and extends to the coast both on the east and the west.

Owing to the nearness of iron and coal, the city of Glasgow, on the Clyde river, has become a great manufacturing center. Iron steamships built on the banks of the Clyde may be seen in all the large ports in the world.

The mountains in England and Wales are little more than high hills. Southward from the Cheviot hills, the highland gradually becomes so low that it merges into the lowland. In Wales, the ranges are higher than in England. This highland district in England and Wales is good grazing land. It is also one of the richest coal and iron regions in the world. Many large manufacturing cities are therefore located in this part of Great Britain. Their foreign trade is carried on chiefly through the great ports of Liverpool on the Mersey river, and London on the Thames.

Scene on the Coast of Ireland.

The middle and southeast parts of England form a rich farming and grazing lowland, but it cannot raise enough grain and cattle to feed the millions of people who live in that country. Shiploads of wheat, corn and beef are sent from the United States to England. Shiploads of cotton also from our Southern plains are sent to the English mills. In return we receive many kinds of cloth and of iron goods.



Tower of London.

Before coal was used in factories, and before iron was needed for engines and machines, the farming lowlands of England formed the richest part of the country. Western England, with its mines and factories, has now far outstripped the eastern lowlands, not only in wealth, but also in population; not because the farms are poorer, but because the manufacturing districts have made the greater progress.

London, the largest city in the world, is on both banks of the Thames. This is the longest stream in the British Isles, yet it is little more than one half as long as the Hudson river. The Thames, the Hudson and the Mersey valleys are all slightly drowned, forming deep water ways. They carry the shipping for the largest three seaports in the world,—London, New York and Liverpool.

On this page are pictures of two of the famous buildings in London. Westminster Abbey is a very old cathedral in which for centuries the rulers of England have been crowned. The *Tower of London* is an ancient fortress or castle. Many famous men and women have been imprisoned there and then executed near by, but it is no longer used for a prison.

Westminster Abbey.

Many centuries ago, the site of London was the place where a number of roads met on the banks of the Thames. Marshes and forests made the roads converge in that neighborhood and there a town was started. At first the river was crossed by a ferry; then as the town grew to a city a bridge was built. Several large bridges now cross the Thames in London.

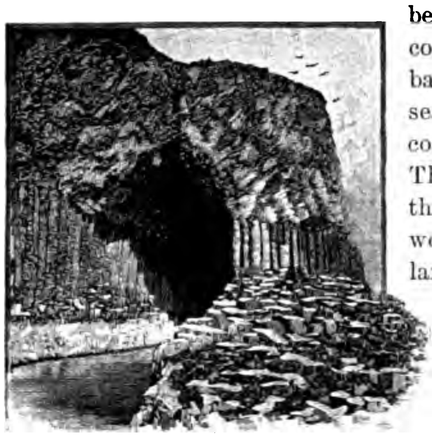
The slight drowning of the Thames valley carries the deep tidal waters as far up the river as London. When the people of England began to trade by way of the ocean, London became the principal trading station, because the city stood at the highest point on the river where ocean vessels could meet the river boats and exchange cargoes with them.

No other city in Great Britain is so well situated as London to carry on commerce with the mainland of Europe.

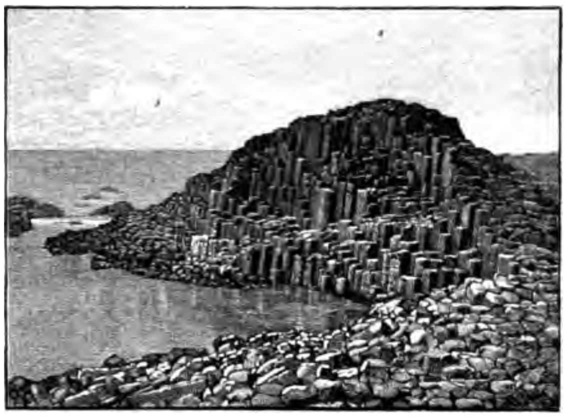
The British nation now has a great number of large and small colonies or possessions scattered over the earth. Among these are Canada, Australia and India. London owes its growth largely to the trade of the British people who reside in the colonies. Before 1776, the eastern part of what is now the United States was a British possession.

The groups of low mountains or hills in Ireland are mostly near the coast. The inland district is a wide plain.

The heavy rollers, or storm-waves, from the North Atlantic beat violently against the rugged coast of western Ireland and cut back the headlands into high sea-cliffs. For this reason the coast is dangerous for shipping. The waves beat so strongly on the steep cliffs that even in fair weather boatmen can hardly land without seeking one of the harbors in the bays.


**Fingal's Cave, Isle of Staffa.**

Ireland, in the path of the westerly winds, lies to windward of Great Britain and therefore receives the heavier rainfall. Ireland is often called the "Emerald Isle," because the grass there is green all the year. The inland district has fine grazing lands, and the country is noted for its dairy products.


**Giant's Causeway, Ireland.**

Large areas of the plain in Ireland are low and boggy. They are so level that they cannot easily be drained and are therefore of little value for farming or grazing. Thick layers of decaying moss cover the bogs and supply a kind of fuel known as *peat*, or *black turf*. The peat bogs are therefore of great service.

The soil in many parts of Ireland is suited to the growth of flax. Among fiber plants, flax ranks next in value to cotton, for cloth making. The flax grown in Ireland is made into the fine linen for which the city of Belfast has long been noted.

**Lakes of Killarney, Ireland.**

The small pictures on this page show some of the places of greatest interest on or near the coast of the British Isles.

The *cliffs of Dover* face the strait of Dover. The high shore is made of chalk and in clear weather can be seen from the coast of France. On the French coast also are white cliffs that can be seen from Dover. These high banks, like all other shore cliffs, show that the coasts are wearing back, and that the strait of Dover was once narrower than it now is.

*Land's End* is a cape at the southwest point of England. This cape is not far from the tin mines of Cornwall.

**Hastings, England.**

*Hastings* is a fishing town southeast of London. Not far from this town a famous battle was fought nearly a thousand years ago, when *William the Conqueror* crossed over from France and invaded England. This is known as the battle of Hastings.

**Shannon River, Ireland.**

*Giant's Causeway* is on the north coast of Ireland. *Fingal's Cave* is on the island of Staffa, off the west coast of Scotland. The rocky columns, shown in these pictures, are made of lava. Sheets of lava, in cooling, are often divided by cracks into countless columns like these. The beautiful *lakes of Killarney* are among the low mountains of southwest Ireland. The *Shannon river* drains the middle lowland of the Emerald Isle.

**Chalk Cliffs, Dover, England.**

## 84. Low Europe — Western Part.

West of the Alpine highland lies the lowland of France.

In what general direction do the rivers of this lowland flow? Name two of them.

Between the Pyrenees and the wide mouth of the Gironde river extends a young coastal plain, low and flat. This region is known as the *Landes* and consists of wide marshes and sandy tracts.

**Land's End, England.**

**Northward from the middle Pyrenees stretches a gently-sloping alluvial fan built of waste from the mountains. The length of this fan, from the mouth of the mountain valleys to its outer edge, is about fifty miles.**

**The people in the Landes are mostly shepherds. Some of these go about on long stilts, but the custom is dying out. The eastern part of the Gironde basin has many large vineyards.**

SCENE IN HOLLAND

SCENE IN RUSSIA

LANDES FRANCE

RHINE FLOOD PLAIN

VOLGA RIVER

Northward from the Gironde river the central part of France is rolling and hilly.

Very low plains lie along the southern shore of the North sea. Part of this lowland is a young coastal plain, and part is the delta plain of the Rhine river. In some places, the land surface has sunk below the level of the sea, and dykes have been built to keep out the salt water. Portions of the plain have been reclaimed from the sea. Lagoons were surrounded by dykes to prevent more water from flowing into them and were then pumped dry.

**The coastal plain forming part of this lowland is covered with a layer of sand containing seashells, and is therefore known to have been formed under the sea. Beneath the sand are layers of peat made of land plants, showing that the region was dry land before the sandy layer was deposited by the sea. In the peat are found Roman coins about two thousand years old. These coins show how very young the coastal plain must be, for it is younger than the peat. This part of Europe must have been under the sea and raised again within the last two thousand years.**

**Battle-scarred House, Waterloo, Belgium.**

Canals form a network over these lowlands and afford cheap water ways to all parts of the low country. Thousands of windmills are kept busy pumping water from the fields into the canals. A man's wealth may there be counted in windmills and cattle. One portion of these flat plains is known as *Holland*, or the *Netherlands*, — meaning *lowerlands*. On the southwest is Belgium.

The Rhine river, above its delta plain, has cut a deep valley through a broad rolling upland. Many of the Rhine branches also have worn valleys in this upland.

The Rhine is navigable to the border of the Swiss plateau. A channel has been cut for this river, in its middle course, so as to give a more direct route than through its old windings. The Rhine has formed flood plains on which many large cities have been built. The valley-sides, sloping down to the flood plains, are far-famed for their vineyards.

The upland through which the Rhine flows is an old mountain region worn low and even, and then raised again. This is the old region mentioned near the close of lesson 77.

Most parts of these low mountains are wooded, and the Germans therefore speak of them as *forests* and not as *mountains*. Thus, they refer to the *Black forest* (*Schwarzwald*) — meaning *Black mountains*. In the forests are firs, pines, oaks and beeches, — both soft-wood and hard-wood trees.

This old upland region, rich in iron ore and coal, extends across Belgium and into France; also, eastward through Germany. The old mountains which rise above the upland are the hardest parts of the region, not yet worn down to the general level.

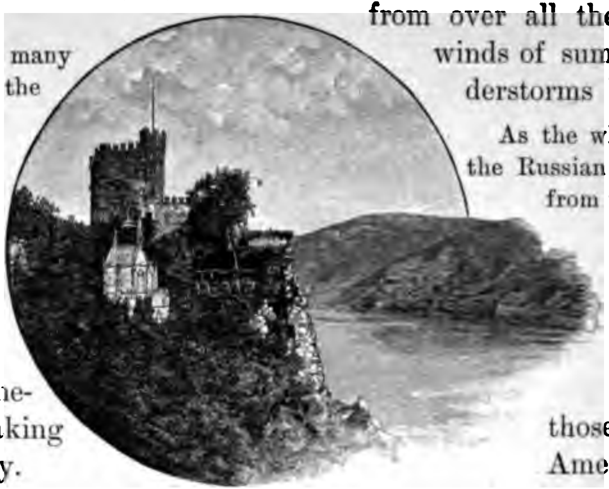
The battle-scarred house shown in the picture is near the village of Waterloo, about nine miles southward from Brussels, in Belgium. The house was torn by shot and shell in the great battle of Waterloo, in which the power of Napoleon was broken. This famous French general was banished to the lonely island of St. Helena, where he died. *See map on page 89.*

Northeastward from the Netherlands, low swampy or sandy coastal plains border on the North and Baltic seacoasts. These lowlands are crossed by the Elbe, the Oder and the Vistula rivers, flowing from the border of the highland region.

In this lowland ended the ancient ice-sheets which crept from the snowy Scandinavian highland across the Baltic sea. *See lesson 83.* As the ice melted at its southern end along the coast of Germany, the rock waste which had been dragged along formed many low hills, or moraines. In the hollows among these moraines lie countless little lakes.

Along the south shore of the Baltic sea are many bays partly inclosed by bars like those along the Carolina coast in the United States.

The regions on the west and north of the Alpine highland are in the path of the westerly winds of the cool belt and are therefore well supplied with rainfall. Cereals are plentiful in the rolling uplands, and many of the sunny slopes of the river valleys are covered with vineyards. Most of the grapes are used in making wine, some of which is sent to our country.



Castle on the Rhine.

A large and thriving industry, on the plains reaching from France through Germany and into the valley of the Danube, consists in raising sugar beets and making sugar from their juice.

We have learned that iron ore, coal and other minerals abound in the old mountain uplands. These products have led to the building of mills and factories of almost every kind. Cloth and iron goods are leading manufactures.

Excellent clay for making pottery, and sand for making glass, are found in many parts of the region west and north of the Swiss highland.

Lorely Rock on the Rhine.

The western part of Low Europe is thickly settled, because the climate is good, the country is suited to easy travel, and products are plentiful. Among the great centers of trade are Paris, Antwerp, Amsterdam, Hamburg and Berlin.

## 85. Low Europe — Eastern Part.

The great lowland of eastern Europe is known as the *plain of Russia.* It forms with the Siberian plain the northern lowland of Eurasia. The plain of Russia stretches from the Black sea and the Caucasus mountains to the Arctic coast, and includes one half of the continent.[1]

One of the richest petroleum fields known in the world is in the region of the Caucasus mountains. Oil abounds near both the east and the west ends of the range. In recent years much attention has been given to the boring of wells, and to the refining and shipping of the oil. This region now rivals the oil fields in the northern part of the Alleghany plateau.

The cold and heavy winter air of the interior plain of Russia helps to keep out the sea-winds. The heaviest rainfall therefore is in summer when the heated air is light and is easily pushed upward by the cooler winds from over all the border waters. These sea-winds of summer cause showers and thunderstorms like those on our prairies.

As the whirling westerly storms pass over the Russian plain they draw in warm winds from the south and cold winds from the north, giving changeable weather like that in the Mississippi valley.

The northern portion of the plain of Russia consists of frozen treeless tundras like those along the Arctic coasts of America and Asia. South of the tundras lies the forest belt which crosses the northern plain of all Eurasia.

The portion of the Russian plain known as ***Finland*** is very flat and contains thousands of lakes. The southern half of Finland is in the forest belt, but the northern part merges into the desolate tundras.

The surface of Finland was scoured by the ancient ice-sheet which spread out from Scandinavia. This region, like New England, has many lakes formed by the scouring of the ice or by the heaping of its rock waste. There are also many falls caused by the turning of streams into new channels across rocky ledges.

On the south of the forest belt are fertile treeless plains extending to the Black sea and to the salty steppes around the Caspian sea. The plains, except in the drier salty portion, yield immense crops of grain, and afford pasturage to large numbers of cattle, horses and sheep.

Through the forest belt and across the plains flows the Volga, the largest river in Europe. The Volga basin comprises about one fifth of the plain of Russia. The main river in this basin rises in marshes near the Valdai hills. These hills are only a few hundred feet above sea level, but many large streams rise in or near them.

Old Bell of Moscow.

For a long distance the Volga flows eastward, separated by an almost level plain from the Dwina on the north. Into what bodies of water do these rivers flow?

The Volga river, with its network of canals, forms the main water way through the Russian plains. It reaches almost all parts of the forest and grain districts, the mining region in the Ural mountains, the fur belt in the Dwina basin, the oil wells near the Caucasus range, and the salt beds around the Caspian sea. These water routes lead to all the border seas of the plain of Russia.

St. Petersburg is the largest city in Russia. Odessa is the chief grain port in the southern part of the great plain.

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[1] Mt. Elbruz, in the Caucasus range, is the highest mountain in Europe, but its summit is nearly 1000 feet lower than that of Mt. Logan.

# AFRICA.

## 86. Africa.[1]

A deep and wide canal, about one hundred miles long, has been dug across the isthmus of Suez. The canal has no locks, for the two seas which it connects are on about the same level.

Before the Suez canal was made, the water route from all ports in Europe to India led around the cape of Good Hope. Vessels can now go through the canal and thus save about 4000 miles in the voyage. Port Said is at the Mediterranean end of the canal. *See picture on page 90.*

The canal is used chiefly by steamers and they pay a high toll. Sailing vessels that pass through the canal are towed, and as the expense is very great, nearly all vessels that depend on sails and wind go round the Cape.

Africa has a rounded outline, broken by very few bays. Almost the entire continent is a highland. Its average height above sea level is double that of Europe. The southern half is higher than the northern, and the eastern part is higher than the western. The coastal plains are very narrow, because the border ranges of the highland lie near the sea. Almost all parts of the continent inland from the coast ranges consist of plateaus.

All the great rivers of this continent have falls or rapids, and not a stream is open very far inland to large vessels from the sea. Great areas in Africa are deserts. The coastal regions near the equator are very unhealthful. For these and other reasons, large parts of Africa are still little known. Until the present century, only parts of the coastal regions of the "Dark Continent" had been explored, except the lands in the north; but we know far more about inner Africa to-day than was known about inner North America one hundred years ago.

Water Carrier of Morocco, Northern Africa.

Africa is the hottest of the continents. Only the extreme southern part of this great land mass is in the cool belt.

A wide region across the middle of the continent is visited by the equatorial rains. The southeast coast is in the path of the trade winds from over the Indian ocean. These winds give rainfall to the seaward slopes of the highlands in their path, but give very little moisture to the inland region of southern Africa.

Woman of Morocco.

The Sahara desert is swept by the northeast trade winds. Their effect is very drying, because they blow mostly from over wide land areas and gradually become warmer as they approach the heat equator.

At the north and south ends of the continent, the highland slopes facing the sea receive winter rains when the trade winds shift towards the equator, and the storms of the westerly winds reach those parts of the continent. *See maps on page 24.* The summers are dry.

Because of this arrangement of winds and rains, Africa has a wide forest belt across its equatorial region, where the rains are frequent and heavy. On both sides of this belt, the forests merge into open grassy plains, where the rains are lighter, — falling when the equatorial rain belt moves over them. Beyond these grassy plains lie desert regions, — the Sahara in the north and the Kalahari in the south.

Near the equator the summer heat is not so strong as it is in the deserts. In the middle belt of the continent, clouds shut out much of the sunshine, and dense forests shelter the ground when the sun shines from a cloudless sky. In this belt, the land and the air are also cooled by frequent rains.

Intense summer heat is felt in the Sahara and Kalahari deserts, but especially in the former, although it is so far from the equator. There are neither trees nor grasses to shield the surface. During

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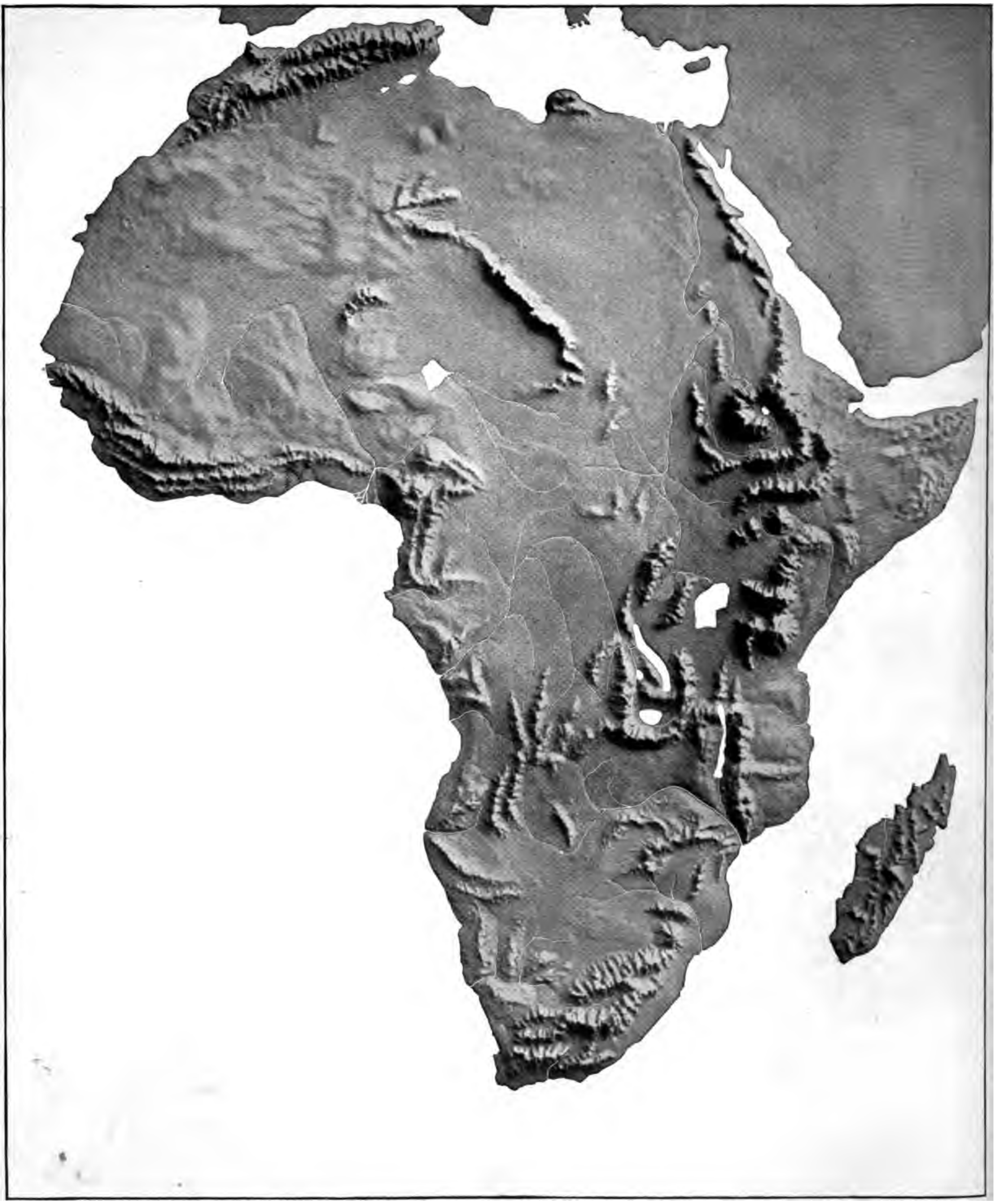
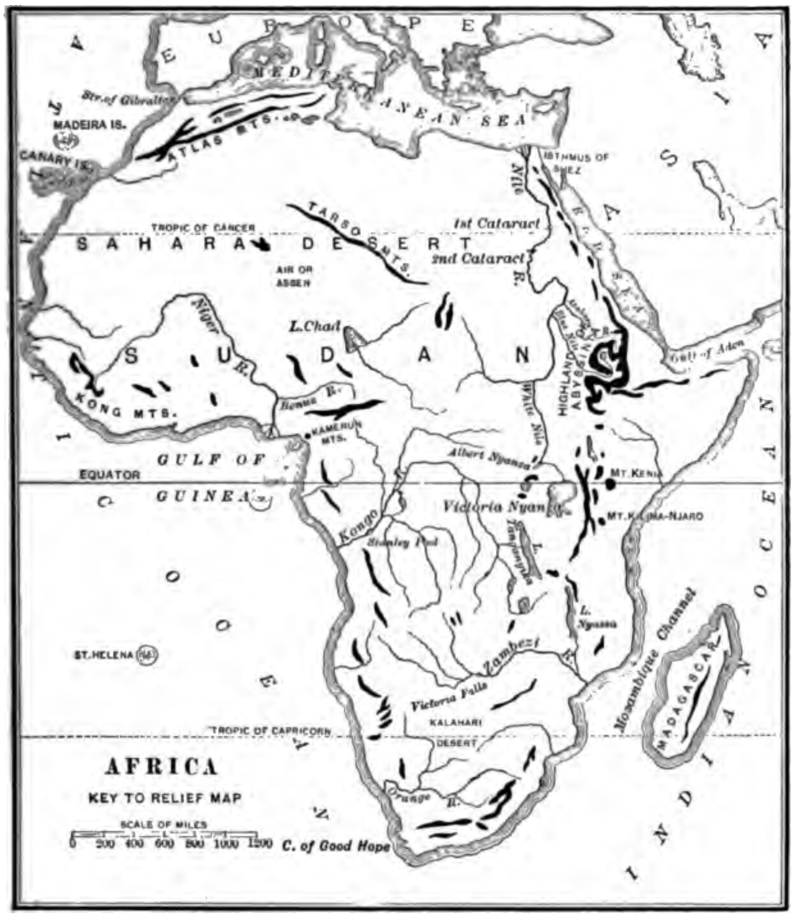
[1] The map studies on page 89 are to precede this lesson.



RELIEF MAP OF AFRICA.

the day, the dry sand or rock is quickly heated, and in turn heats the air. During the night, the bare surface and the cloudless air often become very cool.

The southern half of Africa is not so hot as the northern. In the south the continent is narrower and the interior is nearer the sea. The inland regions are therefore sooner reached by sea-winds, with clouds and occasional rains.



## 87. Map Studies.

*Note:* Now that we have studied four continents, we should be able to *read maps*, without the aid of many questions.

Describe the position of Africa with regard to the other continents and the oceans.

Sketch the map of Africa. Which of the continents that we have studied does it most closely resemble?

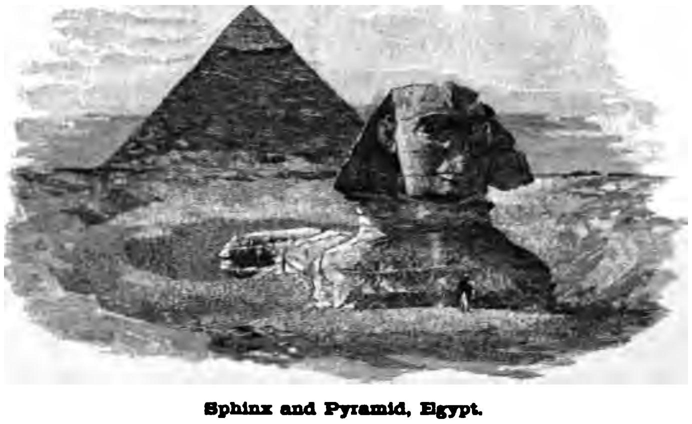
How does Africa compare in size with North America? With Asia? *Compare globe maps.*

What does the relief map show about the surface of Africa? Describe the courses of five large rivers in this continent.

Refer to the maps on pages 21, 24 and 25, and tell what you can about the heat belts and seasons in Africa, — the winds which carry moisture to it, — and the ocean currents which reach its shores.

In what respects is Africa like any other continent? In what respects does Africa differ from each of the other continents?

What seas almost sever Africa from Eurasia? What isthmus connects the two land masses?



Sphinx and Pyramid, Egypt.

## 88. Egypt and the Nile.

The highest plateau in Africa is that of Abyssinia. Its east slope facing the Red sea is steep and is not broken by large river valleys. The west slope is more gentle and is drained by branches of the Nile river.

Egyptian.

The main river of the Nile system rises in the lake region of middle Africa and is the only large river flowing northward to the Mediterranean sea. The basin of the Nile is thought to be about as large as that of the Mississippi.

Where is Lake Victoria (Victoria Nyanza)? On which side of the equator does the greater part of this lake lie?

Lake Victoria is about three fourths of a mile above sea level. Its outlet is the river Nile.

Name two Nile branches that rise in the highland of Abyssinia.

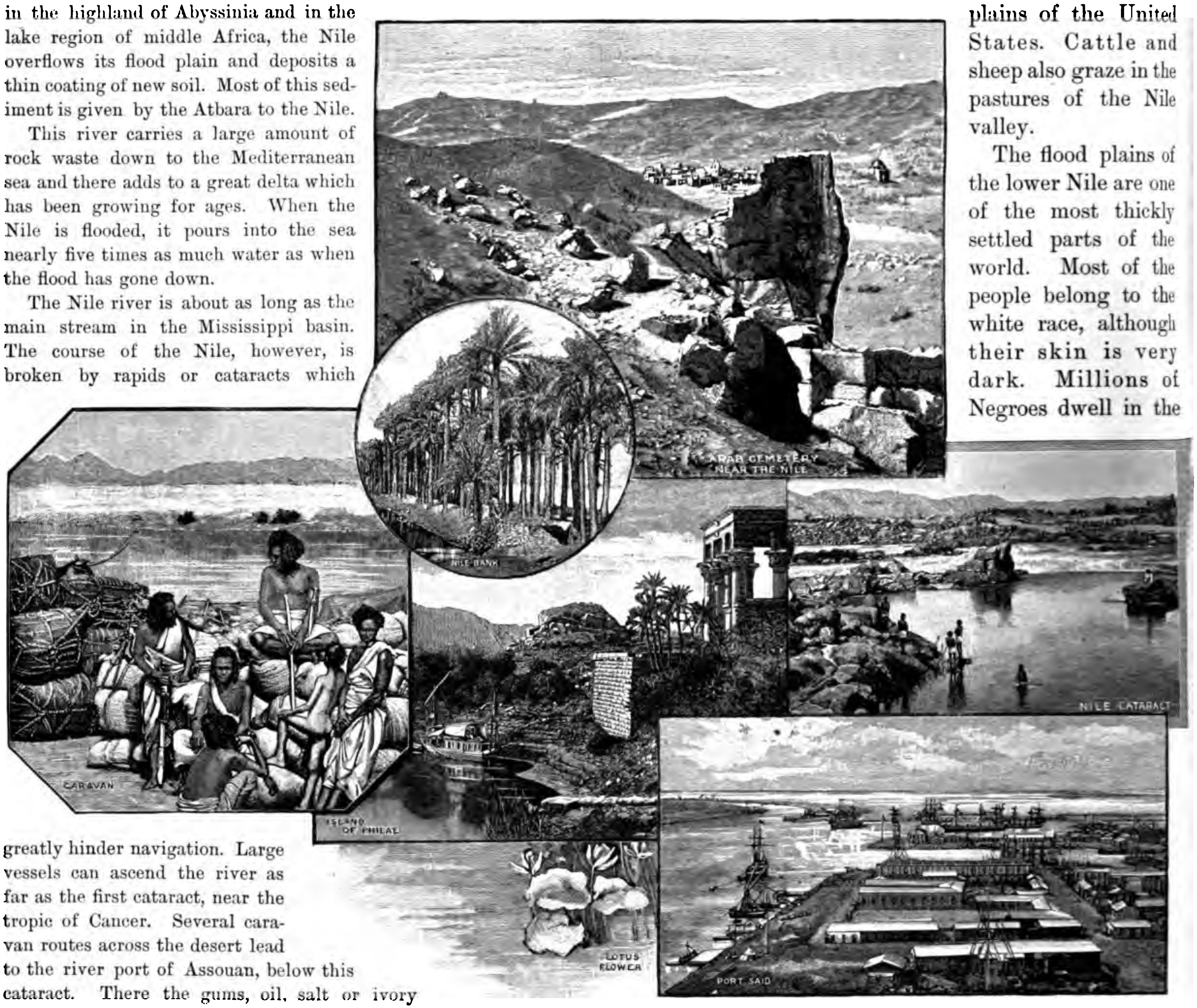
For about five hundred miles along the White Nile, above its junction with the Blue Nile, there is only a narrow fringe of verdure. The rainfall is light and the country on both sides of the river resembles the steppes of Russia. In some places however are park-like plains where grassy tracts alternate with groves. Giraffes and elephants browse in the wooded parts of the plains. Acres of lilies float on the still water of the river, and many crocodiles and hippopotamuses swim about.

The Blue Nile and the Atbara are the main branches from the east. During the northern summer, when the equatorial rains reach the highland of Abyssinia, many torrents pour down these tributaries; but as the dry season approaches, the torrents dwindle away till only muddy

**pools or even dry channels remain. The deeply-cut beds of these streams show that a great amount of waste has been carried away. A large part of the finer waste is borne down the Nile.**

For hundreds of miles this great river flows through the desert and does not receive a single tributary. There the river has cut a long and broad valley and has made a flood plain several miles in width. Every summer, after the equatorial rains have fallen in the highland of Abyssinia and in the lake region of middle Africa, the Nile overflows its flood plain and deposits a thin coating of new soil. Most of this sediment is given by the Atbara to the Nile.

This river carries a large amount of rock waste down to the Mediterranean sea and there adds to a great delta which has been growing for ages. When the Nile is flooded, it pours into the sea nearly five times as much water as when the flood has gone down.



**Entrance to Suez Canal.**

The Nile river is about as long as the main stream in the Mississippi basin. The course of the Nile, however, is broken by rapids or cataracts which greatly hinder navigation. Large vessels can ascend the river as far as the first cataract, near the tropic of Cancer. Several caravan routes across the desert lead to the river port of Assouan, below this cataract. There the gums, oil, salt or ivory carried for hundreds of miles by camels, can be placed on boats and floated down to the large cities in the delta plain. Small vessels can be hauled over the first cataract and can then sail up to the second. There are many boats on the river between the upper cataracts.

How different is the basin of the Nile from that of the Mississippi! One has only a narrow strip of fertile land with wide deserts on either side. The other also has its fertile flood plain, but this is bordered by uplands of wonderful fertility.

How different are the rivers in these great basins! The Nile is open to large vessels for only about five hundred miles in a direct line from its mouth, and within that distance there is not a single tributary. The Mississippi and its branches afford thousands of miles of water navigable from the sea and leading to almost every part of the wide fertile plain.

The Mississippi river becomes broader and deeper as it flows onward, but the Nile becomes narrower and shallower in its lower course. Can you tell why?

In harvest time on the fertile delta and flood plains of the Nile may be seen cotton, sugar cane, rice, wheat, corn and other products like those raised on the Southern plains of the United States. Cattle and sheep also graze in the pastures of the Nile valley.

The flood plains of the lower Nile are one of the most thickly settled parts of the world. Most of the people belong to the white race, although their skin is very dark. Millions of Negroes dwell in the basin of the upper Nile, in middle Africa.

Cairo, the trade center of the delta and flood plains of the Nile valley, is the largest and most important city in all Africa. It is a very old city.

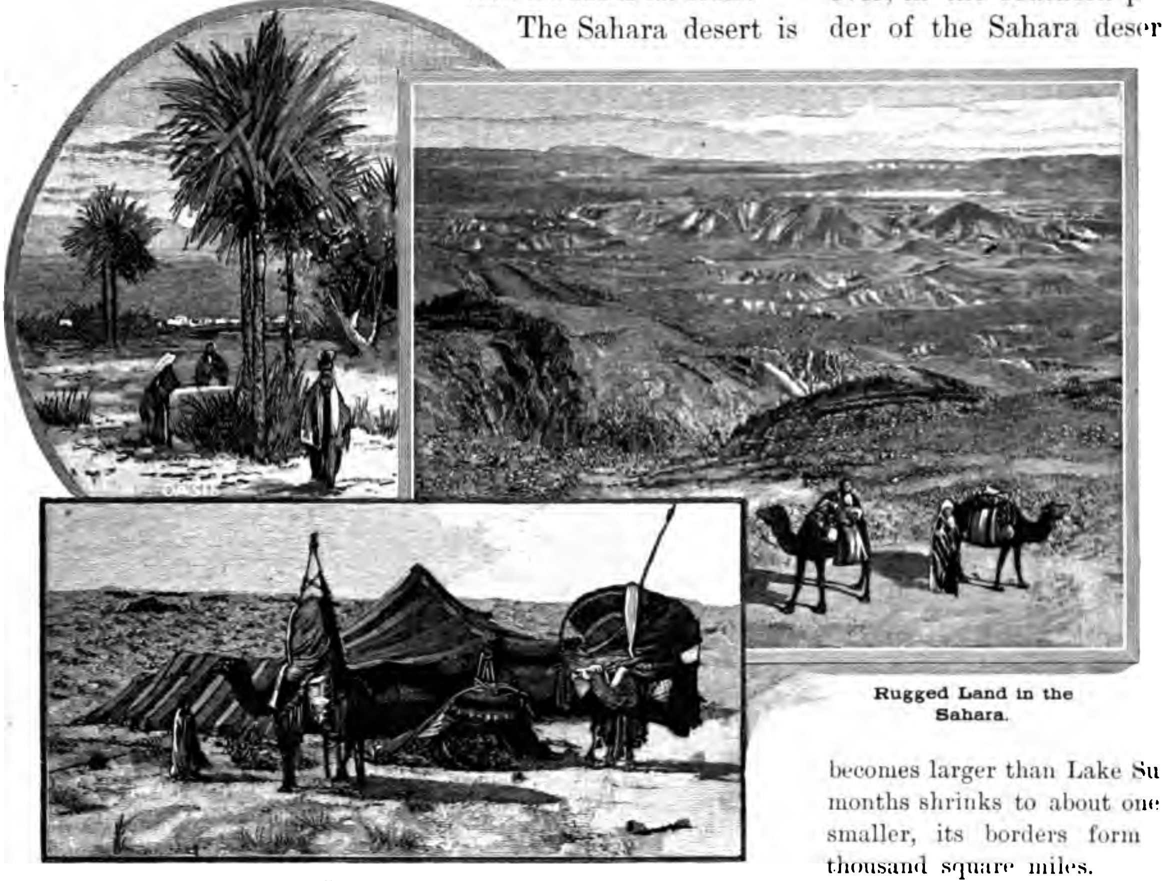
In Lower Egypt are found the greatest monuments ever built by man. They are known as *pyramids* and are the tombs of the ancient kings. *See picture on page 89.* Several pyramids can be seen from the citadel of Cairo. One of these is now 450 feet high, and the length of each side of its square base is about 750 feet, or nearly one seventh of a mile.

*The Sphinx* shown in the same picture is not far from Cairo. This curious monument, showing a man's head on a lion's body, is nearly 200 feet long, and was mostly carved from a ledge.

and too far north to be reached by the equatorial rain belt. Even along the Atlantic coast of the desert, there is no rain. The drying trade winds blow there almost all the year round. The winds are active in the daytime, but they generally fail after sunset.

Although hot in summer, the desert air, especially at night, is cool when the sun is far south.

The Sahara desert is part of a great belt of arid regions whose rainfall is so light that they have no overflow to the sea. The desert belt crosses Arabia, Iran, the Middle Basin and the Gobi region. A wide branch of this barren belt spreads northward around the Aral and Caspian seas.



Rugged Land in the Sahara.

Bedouin Camp in the Sahara Desert.

We have studied about the great mountain barrier of the Himalayas. The Sahara also forms a barrier between northern and southern Africa. No cattle, horses nor sheep are native to the lands south of the vast barren region, but many of these animals have now been taken there. On the other hand, middle and southern Africa have many kinds of animals that are not found north of the desert. *See page 116.*

We have read that the Himalayas rise between the yellow and the white races. The Sahara lies between the homes of the white and the black races, although large numbers of the white and the black people have now mingled in the border lands of the desert and in the desert itself.

Bedouin.

### 90. Sudan.

A wide belt of country south of the Sahara desert is known as *Sudan*. It extends from the Atlantic coast to the highland of Abyssinia.

What gulf is south of western Sudan? What large river from Sudan flows into this gulf?

What lake receives the drainage of the interior region between the Niger and the Nile basins?

Sudan is wholly north of the equator but is within the range of the equatorial rains. They are heaviest, however, in the southern part, and decrease towards the border of the Sahara desert. Southern Sudan therefore is heavily forested, but northward the trees give place to open grassy plains which merge into the desert. The greater part of the country is fertile.

Eastern Sudan is in the Nile basin. *See lesson 88.*

The greater part of central Sudan is in the basin of Lake Chad, — the largest basin of interior drainage in Africa.

The main stream which feeds Lake Chad flows from the rainy forest country far in the southeast. Very little is known about the region in which the stream rises.

Lake Chad is shallow and its banks are low. As the season changes from wet to dry, the lake varies greatly in size. In the rainy summer season, it becomes larger than Lake Superior and then during the dry winter months shrinks to about one fourth its size. As the lake becomes smaller, its borders form swamps or marshes covering many thousand square miles.

When Lake Chad is swollen by rains, it overflows towards the northeast. The overflow follows a *wady*, or river channel that is dry except in the wet season. The wady from Lake Chad leads into the desert, where the water evaporates or disappears in the sand. This overflow keeps the water of the lake almost fresh.

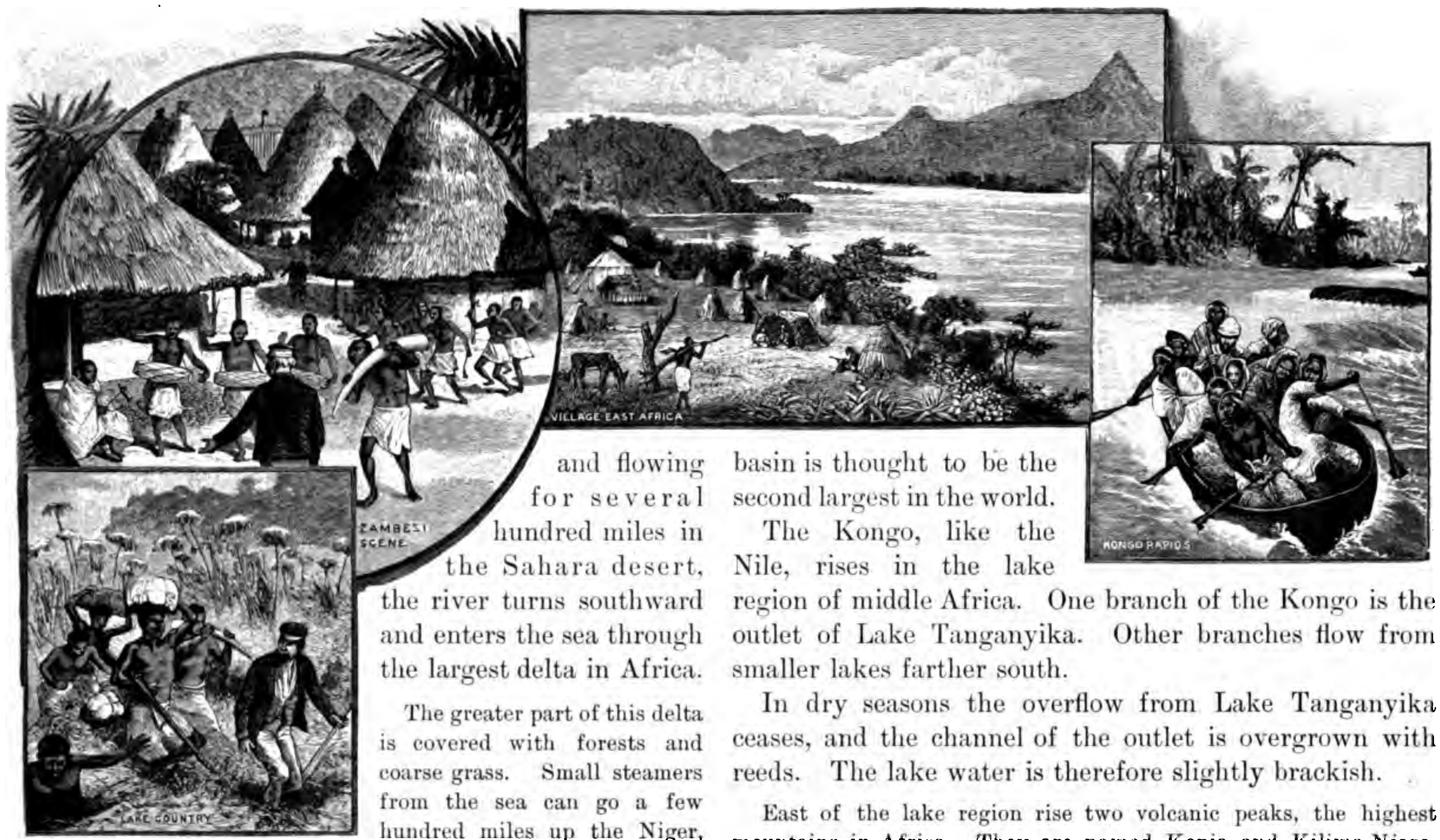
There are many large towns and villages in the park-like district south of Lake Chad, and the region is thickly settled. Most of the people are Negroes.

These people are well advanced in many respects beyond the savage state, for they carry on an extensive trade and have some manufactures.

The towns near Lake Chad are trade centers where caravans meet. The ivory tusks of elephants form a leading article of export. Camels and horses in large numbers are reared for market. Grain and cotton are important products.

The so-called *Kong mountains* are chiefly the southern border of a much-worn plateau that rises in broad terraces from the coast of the gulf of Guinea and spreads far northward. The inland slope of this old plateau is in the basin of the Niger river.

The Niger basin is thought to be about three fourths as large as that of the Mississippi. The Niger river rises in the hilly district near the southwest end of the old plateau region. After making a great bend northward,



and flowing for several hundred miles in the Sahara desert, the river turns southward and enters the sea through the largest delta in Africa.

The greater part of this delta is covered with forests and coarse grass. Small steamers from the sea can go a few hundred miles up the Niger, before their progress is stopped by rapids; but the steamers can ascend the Benue branch to a point about 600 miles from the river mouth. No other river in tropical Africa is navigable for so great a distance inland from the sea.

Timbuktu, on the Niger, was once an important center of the caravan trade, but it is now far surpassed by towns farther east, such as Kuka and Kano which together have a population of about 100,000. *See Africa in the Supplement.* Each year many camels cross the desert, carrying ivory, ostrich feathers and gold dust from the basin of the Niger. The caravans return southward with cloth, trinkets and salt.

The coastal regions south and southwest of the Niger basin are reached by the equatorial rain, and most parts of them are forested. White people from Europe have many trading stations along this coast. The products are like those of the Niger basin.

The western portion of Sudan, like nearly all other portions, is thickly settled. Most of the people are Negroes, but many others belong to a very dark branch of the white race, known as *Hamites.*

The Kamerun mountains near the head of the gulf of Guinea consist of one large volcanic peak and many small ones.

### 91. The Kongo Basin.

The Kongo basin occupies the greater part of middle Africa and lies west and southwest of the upper Nile basin. Almost all the Kongo basin is a plateau with a general slope westward. The average height of the region is about half a mile above sea level.

The Kongo basin is mainly in the southern portion of the equatorial rain belt and parts are heavily wooded. This basin is thought to be the second largest in the world.

The Kongo, like the Nile, rises in the lake region of middle Africa. One branch of the Kongo is the outlet of Lake Tanganyika. Other branches flow from smaller lakes farther south.

In dry seasons the overflow from Lake Tanganyika ceases, and the channel of the outlet is overgrown with reeds. The lake water is therefore slightly brackish.

East of the lake region rise two volcanic peaks, the highest mountains in Africa. They are named Kenia and Kilima-Njaro. The former is about as high as Mt. St. Elias. The summit of Kilima-Njaro is a little higher than that of Mt. Logan.

There are rapids and falls in the Kongo river at the place where it cuts its valley down from the plateau to the low and narrow coastal plain. These falls prevent vessels going far inland from the sea. Above the falls, the river is at all times wide, and during the rainy seasons it often spreads for miles from bank to bank.

Small steamers have been carried overland past the falls and now navigate the upper river. There they find an open water way for thousands of miles along the trunk stream and its branches.

The Kongo pours more water into the sea than any other river in Africa. For several miles out from the mouth, the fresh water of the great stream scarcely mingles with the salt water of the ocean. This large flow from the river shows how heavy the rainfall in the Kongo basin must be.

The vegetation of the Kongo basin is very luxuriant. Among the useful food plants are the cassava, the yam, the plantain, corn and sugar cane. Palm oil and cotton are other important products.

Palm oil comes from the seeds of certain kinds of palm trees. The seeds are crushed and then boiled or melted down, and are thus made to yield a valuable oil.

The yam is a large fleshy rootstock resembling the sweet potato. In nearly all hot parts of the world, yams are a common article of food.

Plantains and bananas are almost alike, but the pulp of the latter is the more delicate.

What have you read about cassava? *See lesson 61.*

The basin of the Kongo is the home of many large and fierce animals. Among these are the chimpanzee, the crocodile and the rhinoceros. Every year thousands of elephants are killed there for their tusks.

The natives of the Kongo basin belong to the black race. Their number runs far into the millions. They live mostly in small towns and villages. Many of the huts of these black people are made of grass, woven into mats and fastened to poles.

White people have established many trading stations along the coast and on the upper Kongo and its tributaries. These traders purchase ivory, palm oil and other products.

The two great forested river basins of the torrid zone differ widely in many respects. The Amazon basin slopes to the east; the Kongo, to the west. The one is mainly a lowland; the other, a plateau. The former has twenty-five thousand miles of streams navigable from the sea; the latter has only ninety miles. The Amazon basin is sparsely peopled by scattered tribes of Indians; the Kongo basin supports tens of millions of Negroes.

In what respects do these basins resemble each other?

### 92. Southern Africa.

In the Zambezi basin are found the same changes from forest to grass land and then to desert, as in Sudan. The forests of the Zambezi basin are densest in the northern part, where the equatorial rains fall in summer. The southern part of the basin reaches the Kalahari desert.

The Zambezi is the largest African river flowing into the Indian ocean. This stream is thought to drain an area equal to about two thirds that of the Mississippi basin.

Locate the Victoria falls. These falls mark the place where the river leaves the great inland plateau. At the falls the Zambezi river is a mile wide. The water plunges into a chasm about 400 feet deep, and then runs out through a narrow zigzag gorge.

The Zambezi has built a large delta. The distributaries which cross it are generally barred with sand, but vessels that can float over the bars may ascend for about three hundred miles.

The natives of the Zambezi basin are savages of the black race. They raise grain and have herds of cattle.

The Kalahari desert is in the path of the trade winds from over the Indian ocean, but those winds lose most of their moisture on the seaward slopes of the eastern mountains. Very little rain falls on the inland desert plains.

Bands of small people called ***Bushmen*** live in the Kalahari desert wherever there are tufts of grass upon which antelopes may feed. The Bushmen have no gardens but live by hunting the antelopes. These small savages belong to the Negro race.

The main sources of the Orange river system are in the eastern coast ranges of southern Africa. The greater part of the Orange basin is very dry. Even the main river is too shallow for steamers, and many of the branches flow only during the wet season. There is good pasturage in the eastern part of the basin, but the middle and western parts are little more than a desert.

The southern part of Africa, including nearly all the region south of the Orange river and a small area north of that river, is known as *Cape Colony*. It is crossed from east to west by a rugged plateau that forms the southern end of the great African highland.

The seaward slopes of this plateau, like those of the Atlas highland, have winter rainfall and summer drouth. During the wet months, when the westerly winds prevail, the short streams swell to torrents, but in the dry season they dwindle away.

Wheat and other kinds of grain are raised on the seaward slopes of Cape Colony, and many cattle, sheep and ostriches are reared there. Wool, ostrich feathers and hides are valuable exports.

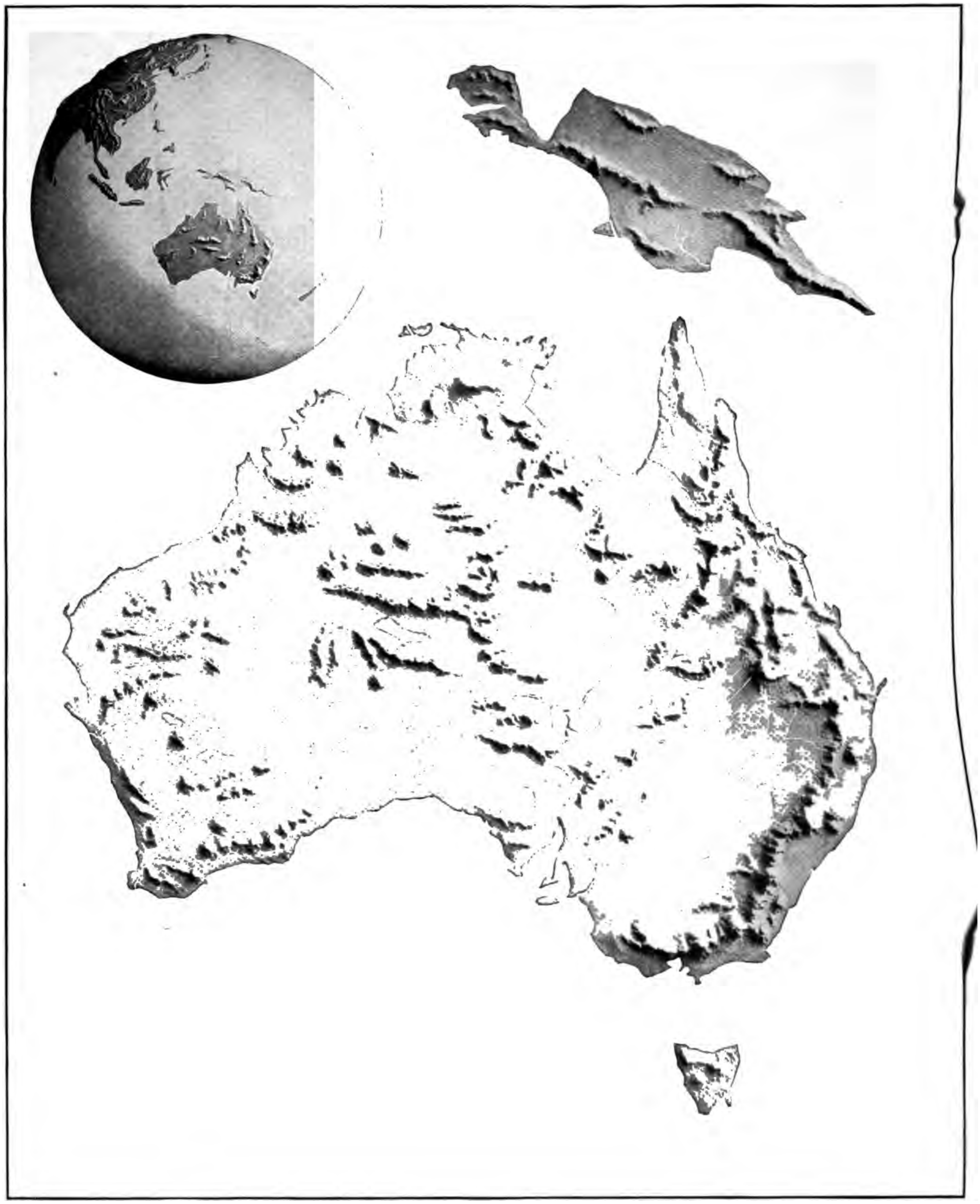
The richest diamond mines in the world are at Kimberley. The value of the diamonds is greater than that of all the other exports of Cape Colony.

The native people of this country belong to the Negro race, but white people from the British Isles control the land and form about one fourth of the population. Cape Town is the chief port in southern Africa.

Near Cape Town rises a huge flat-topped rock called *Table mountain*. Southward from this rocky mass extends a small peninsula ending in the well-known cape of Good Hope.

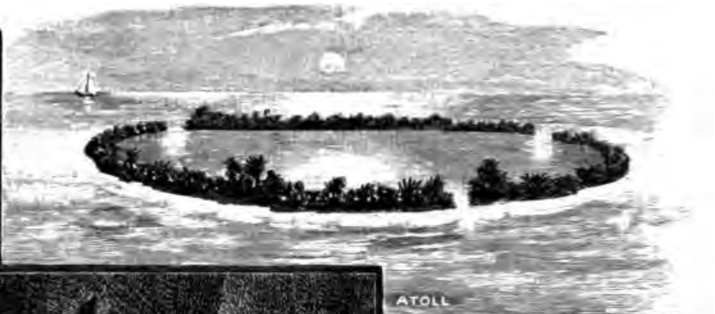
Madagascar, the largest island off the coast of Africa, is about two and one half times as large as Great Britain. Its coastal region is mostly low and unhealthful, but the interior consists largely of grassy or wooded plateaus.

The leading exports are hides and India rubber.



RELIEF MAP OF AUSTRALIA.

are still active, but others are extinct. Coral reefs, called *barrier reefs*, surround most of the lofty islands.



There are about 300 islands in the *Fiji group*, but only two of these are of fair size. The most important is Viti-Levu. These islands are chiefly of volcanic origin. They are rugged and mountainous.

Before white men settled on some of the islands, the Fijians were cannibals, as were also many other groups of Pacific, or "South Sea," islanders. The custom of eating human flesh has not wholly disappeared from all the islands.

The Fijians have strong and well-built bodies, as shown in the picture on page 97. As a race, they are fierce and warlike.

Southeast of the Fiji group are the *Friendly islands*, of which Tonga is the largest. Since white people first went to these islands to teach the natives, most of them have learned to read.

The *Samoa islands* are northeast of the Fiji group. *Apia* is the chief town. The Samoans are very skillful in using canoes, and for this reason their islands are often called the *Navigator's islands*.

Northeastward from Papua are several groups of islands which together take the name of *Micronesia*, meaning *small islands*. Among these groups, the Ladrones are mostly of volcanic origin; but the Caroline, Marshall and Gilbert islands are chiefly the work of coral polyps.

**Honolulu, Hawaiian Islands.**

The savages who dwell in these islands may be grouped with the people of the brown race; but in language and customs, the Micronesians differ from the natives of the large islands of the East Indies.

The natives of the Marshall islands are very skillful in sailing canoes. These islanders often take voyages lasting several months. They carry provisions, but depend on rain for drink. Perhaps the lonely islands far out in the Pacific were in many instances first peopled by castaways who while out in their boats were driven from their homes by winds and ocean currents.

The *Hawaiian islands* are near the tropic of Cancer about 2000 miles southwestward from San. Francisco. These islands were built up by volcanic action, from the deep bottom of the middle Pacific. They form the most important group among the many islands which rise far out in that ocean.

The natives of the Hawaiian islands belong to the brown race. Many people of the white and the yellow races also have settled there. The white people have lately taken charge of the affairs of the islands, overthrowing the power of the native queen.

The lowlands of the islands are fertile. Among the products are sugar cane and rice. Nearly all the Hawaiian foreign trade is with the United States. In exchange for sugar, our country sends provisions and clothing.

Hawaii is the largest of the group of eight islands. Honolulu, the chief city, is on the island of Oahu. This city is reached by steamships from San Francisco.

The Kilauea crater, in the Hawaiian islands, is not very high, but it is the largest active crater known. The floor of this crater is a lake of hot lava which at times rises above the rim and runs off in great streams. The Mauna Loa crater, near that of Kilauea, pours forth more lava than any other volcano yet found.

## 97. The Negro or Black Race.

**In what part of Africa do people of the black race live? *See map on page 102.* What large river basins are in this region? What desert is on the north? What oceans are on the east and west?**

The natives of middle and southern Africa vary in color from black to brown. Most of them have broad flat noses, thick lips and black frizzly hair.

The true Negroes are found in nearly all parts of Sudan, but the people in the tribes southward from Sudan to the cape of Good Hope also belong to the Negro race.

Negress.

The black natives of Australia are classed with the Negro race. Their color is dusky brown, and their hair is curly.

**The number of Australians is small, compared with the number of white people who now live in that continent. There are only about thirty thousand in all the tribes. These are thinly scattered around the continent, chiefly within about two hundred miles of the coast. The Australians are savages of very low grade. They wear but little clothing, and tattoo the skin.**

Australians.

Negro Children at the Paris Exposition.

One of the native weapons is the *boomerang.* This is a curved stick which may be thrown in such a way that it will return to the thrower. Wooden spears and stone hatchets also are used.

The savages of Papua, or New Guinea, belong to the black race.

We know very little about the Papuans. They paint their bodies and go about almost naked. The tribes of the inner part of the island are said to be very fierce.

Kaffir Huts.

Most of the tribes living south of Sudan form a large branch of the black race, known as the Bantu people. Their language does not resemble that of the Negroes of Sudan, but no other marked difference has yet been discovered.

The Kaffirs of southern Africa belong to the Bantu branch of the Negro race. One of the pictures on this page shows a common form of Kaffir hut.

The Negroes in some parts of Africa build houses, weave coarse cloth, and make spears, bows and shields. Many of the black people raise cattle, and plant grain. If the long rivers of Africa were open to ships from the sea, the savages might more easily learn how the white man dresses, prepares food, tills the soil, uses books, and defends himself.

Kaffir Boy.

Sudanese Woman.

Kaffir Girl.

Millions of black people have been taken from their homes in Africa and sold as slaves, but the slave trade has now been almost stopped. The climate of their native land fitted the Negroes to work in the low and hot regions of the earth. Many of the people of Brazil, the West Indies and the Southern plains of our own country are free descendants of African slaves.

The number of people in the black race is about 150,000,000,—one tenth of the people on the earth.

Fiji Islanders.

Fiji Hut.

Malay Hut.

## 99. The Malay or Brown Race.

In what part of the world is the brown race found? Name three large islands peopled by this race. What are some of the products of these islands?

What great island east of Africa is settled in part by people of the brown race?

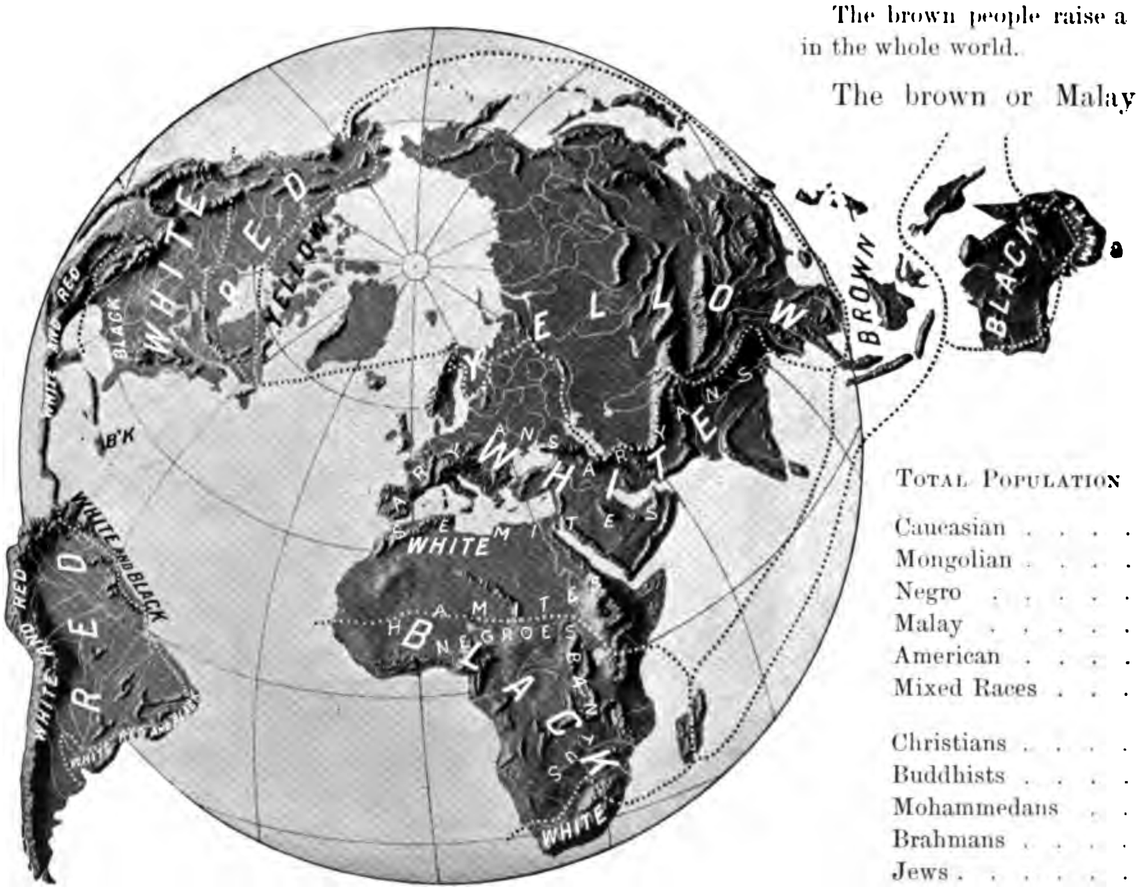
The people of the brown race have coarse black hair, flat faces and short skulls. Many of them have strong and well-built bodies.

The brown people live mostly on islands, but their home includes also the Malay peninsula. Borneo, Sumatra, Madagascar and Java are the most important islands peopled by the brown race, but the region includes countless islands that extend for thousands of miles out into the Pacific.

Many people of the Malay race are yet savages. Others are traders or sailors. Many thousand people of this race inhabit the northern part of New Zealand. These are known as *Maoris*. They are brave and warlike, and have fought hard to prevent the white man from seizing their island home, but they have lost the largest and best parts of their islands.

The brown people raise a very large portion of the spices used in the whole world.

The brown or Malay race includes only about one fourth as many people as the black race.



Map of the Races.

*Reference Tables.*

Note: The statistics given below are to a very large extent mere estimates, not based on census returns. These tables are placed here for reference and not for memorizing.

| | |
|---|---|
| TOTAL POPULATION OF THE WORLD | 1,500,000,000 |
| Caucasian | 690,000,000 |
| Mongolian | 600,000,000 |
| Negro | 150,000,000 |
| Malay | 35,000,000 |
| American | 12,000,000 |
| Mixed Races | 13,000,000 |
| Christians | 400,000,000 |
| Buddhists | 500,000,000 |
| Mohammedans | 200,000,000 |
| Brahmans | 150,000,000 |
| Jews | 8,000,000 |
| Pagans and others | 242,000,000 |

## 101. The Caucasian or White Race.

**What race lives in Africa north of the desert of Sahara? What race occupies the greater part of Europe?**

**Between what races do the Himalaya mountains rise?**

Where have white people settled in North America? In South America? In Africa? In Australia?

The home of the white race in the Old World lies between the lands of the black and the yellow races. It reaches from the desert of Sahara to the Arctic shore, and includes also the part of Asia lying south and west of Tibet. It is thought by many persons that ages ago there lived in central Asia a race of people now called *Aryans*. Large bands of these people roamed about in search of new homes.

Many of the Aryans, with droves of cattle, went into India.

Scotch Piper.

Belgians.

Rhine Women.

Kashmir Soldier.

Parsees, Bombay.

Hindus.

The descendants of this branch of the Aryans are now called Hindus. Their country is one of the most thickly settled in the world. Other bands drove their herds westward, and settled in the grazing lands of Persia. *See the map of Asia.* After many years, one branch of these people moved along the northern shore of the Mediterranean sea. The tribes of this branch have grown to important nations in such countries as Greece, Italy and Spain.

Many tribes of Aryans fought their way across the plains of *Low Europe*. These have grown into the leading nations of the world. They include nearly all the people living on the north of the Alpine system, and most of the white people in the United States, Canada, southern Africa and Australia. The people in the peninsula of Arabia and in the countries on the north of the Sahara desert, as well as in parts of the desert itself, are very dark, but most of them belong to the white race, though not to the Aryan branch. These are called *Semites*.

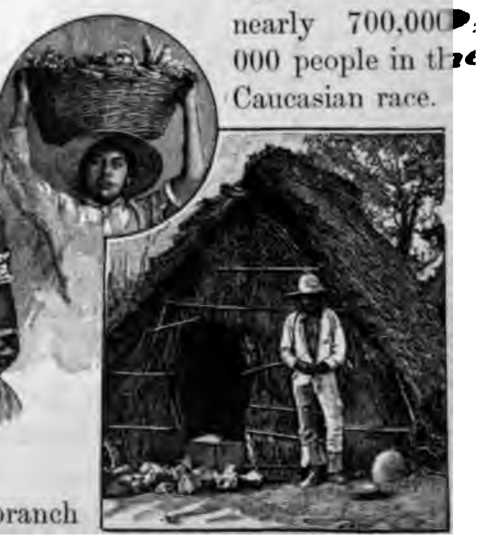
The Semites gave us our alphabet and system of Arabic figures. The Jewish people belong to the Semitic branch, but they are now scattered throughout the leading countries of the world.

Many of the tribes in the Sahara desert and along its eastern and southern borders form a still darker branch of the white race, called *Hamites*.

The Hamites differ from the black race in having thin lips, narrow noses and straight or curly hair. There are many Hamites in Sudan. They have for ages mingled with the Negroes of that land, and the races have become greatly mixed.

The white race outnumbers even the yellow race. These two great races together include all but about one seventh of the people in the world. There are nearly 700,000,000 people in the Caucasian race.

Ceylon Girl.


Mexicans.

The Christian nations, except Russia, are either limited monarchies or republics. Russia and Turkey[1] are absolute monarchies. France and Switzerland are republics.[2] The other nations of Europe are limited monarchies.

The nations in Europe have laid claim to nearly all parts of Africa, as well as to some other lands. Great Britain possesses Canada, Australia, India, Balize,[3] and part of Guiana. Greenland and Iceland belong to Denmark. Cuba is a possession of Spain. The nations in Europe govern several other islands off the coast of America.

All the countries in America are republics, except those named above as possessions of nations in Europe. Our own republic has served as a model for the other American republics.[4]

## 104.

## Review of the Races.

What races are separated by the Pacific ocean? By the Atlantic ocean? By the Indian ocean? By the desert of Sahara? By the Himalaya mountains?

What bounds the land of the Negro on the north? Where are the Bantu tribes? The Kaffirs?

Where do the Papuans live? In what part of Australia are black natives found? In what part of the United States are there many Negroes?

Where is the home of the brown race?

Name three large islands of the East Indies.

Where are Indians found? Eskimos? Lapps? Japanese? Chinese?

Where is the home of the white race in the Old World? When were the Aryans? Where are the Hindus found? The Arabs? The Egyptians?

Tell what race or races are found in each of these river basins: Amazon, Kongo, Mississippi, Nile, Ganges, Lena, Niger, La Plata, Mackenzie, St. Lawrence, Volga, Yang-tse, Amur.

What people live on the highest plateau? In the largest river valley? On the greatest desert? In the coldest lands?

What races live along the shores of the Pacific ocean? Of the Indian ocean?

To which race or races do the people in each of these lands belong? — China, British Isles, Brazil, Arabia, Germany, United States, India, Greenland, Borneo, Russia, Japan, Kongo State, Egypt, Peru, Mexico, Sudan, Java, Australia.

PICTURES. — The "Mosque of St. Sophia" is a Mohammedan place of worship in Constantinople. The "Fire Temple" is supplied with gas from the naphtha wells of Baku, a port on the west coast of the Caspian sea. The "Rock Temple" is a fine specimen of the Hindu temples in India. Pagodas are common in southeast Asia. Paul Revere's signal lanterns were hung in the tower of the "Old North Church." The lowest picture in the group is the beautiful Trinity Church, Boston.

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[1] Turkey is under the rule of Mahommedans, but most of the people in that country are Christians. Japan is now a limited monarchy.

[2] San Marino and Andorra are scarcely more than small cities. *See pages 78 and 80.*

[3] A colony in Central America.

[4] For fuller account of our government, see lesson 124.

### 107. Plants of the Hot Belt.

What lands are included in this belt? *See map on page 18.*

What are the seasons in this belt? When do the rainy seasons come? *See page 24.*

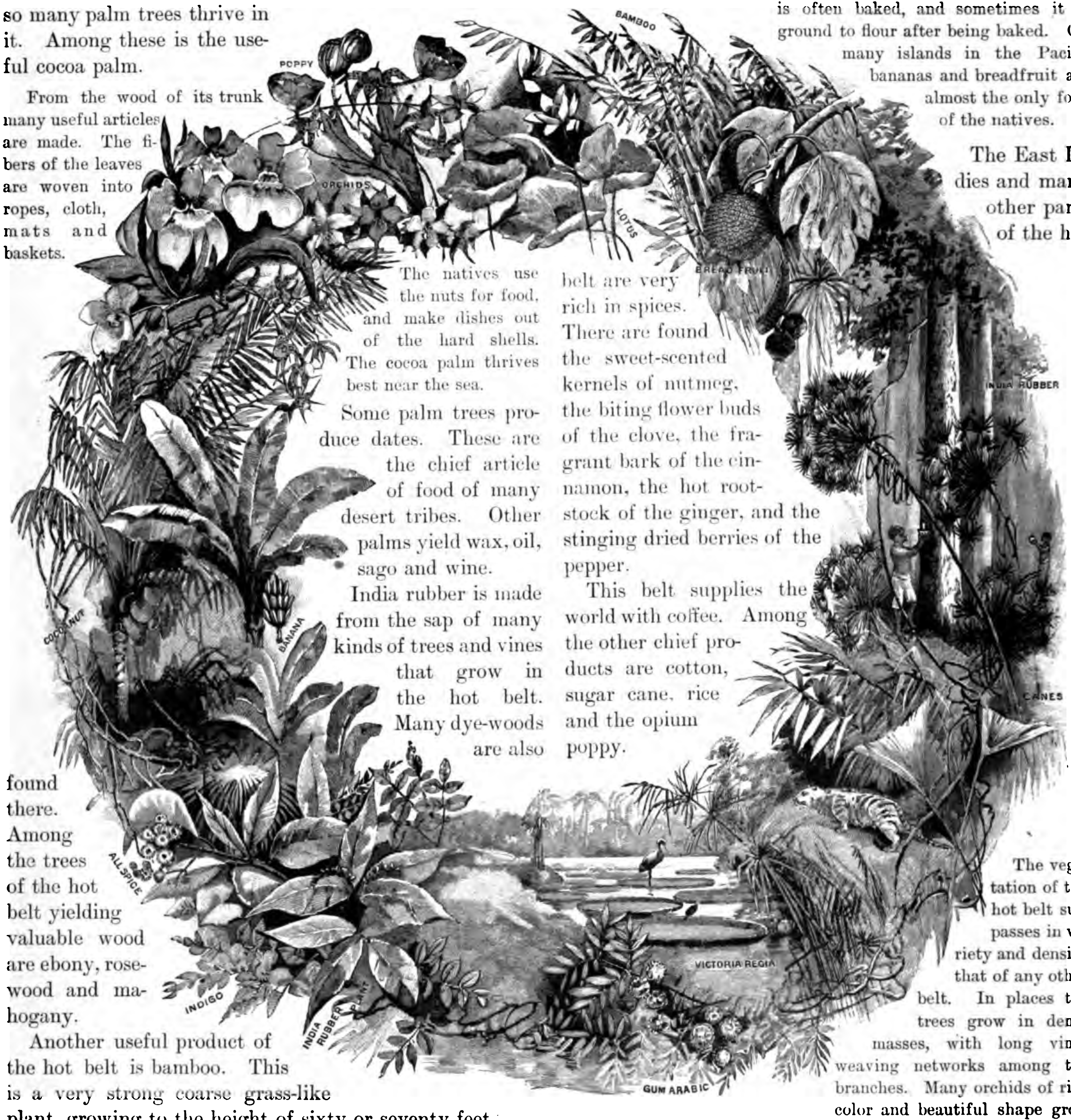
The torrid belt is often called the *belt of palms*, because so many palm trees thrive in it. Among these is the useful cocoa palm.

From the wood of its trunk many useful articles are made. The fibers of the leaves are woven into ropes, cloth, mats and baskets. The natives use the nuts for food, and make dishes out of the hard shells. The cocoa palm thrives best near the sea.

Some palm trees produce dates. These are the chief article of food of many desert tribes. Other palms yield wax, oil, sago and wine.

India rubber is made from the sap of many kinds of trees and vines that grow in the hot belt. Many dye-woods are also found there. Among the trees of the hot belt yielding valuable wood are ebony, rosewood and mahogany.

Another useful product of the hot belt is bamboo. This is a very strong coarse grass-like plant, growing to the height of sixty or seventy feet.



In India, China and the East Indies entire huts with their furniture are made of bamboo. Its seeds and tender shoots are served as food, on dishes cut from its tough joints. Other parts of this plant are used in making baskets, paper, ropes, boats, cloth and weapons.

Among the chief articles of food of people in the hot belt are bananas, plantains and breadfruit. Bananas and plantains are very much alike, — the latter being slightly the coarser.

Breadfruit grows to about the size of a child's head. The fruit is often baked, and sometimes it is ground to flour after being baked. On many islands in the Pacific bananas and breadfruit are almost the only food of the natives.

The East Indies and many other parts of the hot belt are very rich in spices. There are found the sweet-scented kernels of nutmeg, the biting flower buds of the clove, the fragrant bark of the cinnamon, the hot rootstock of the ginger, and the stinging dried berries of the pepper.

This belt supplies the world with coffee. Among the other chief products are cotton, sugar cane, rice and the opium poppy.

The vegetation of the hot belt surpasses in variety and density that of any other belt. In places the trees grow in dense masses, with long vines weaving networks among the branches. Many orchids of rich color and beautiful shape grow in the forests. There are also tree ferns, huge lilies and countless other plants which we can see only in hothouses.

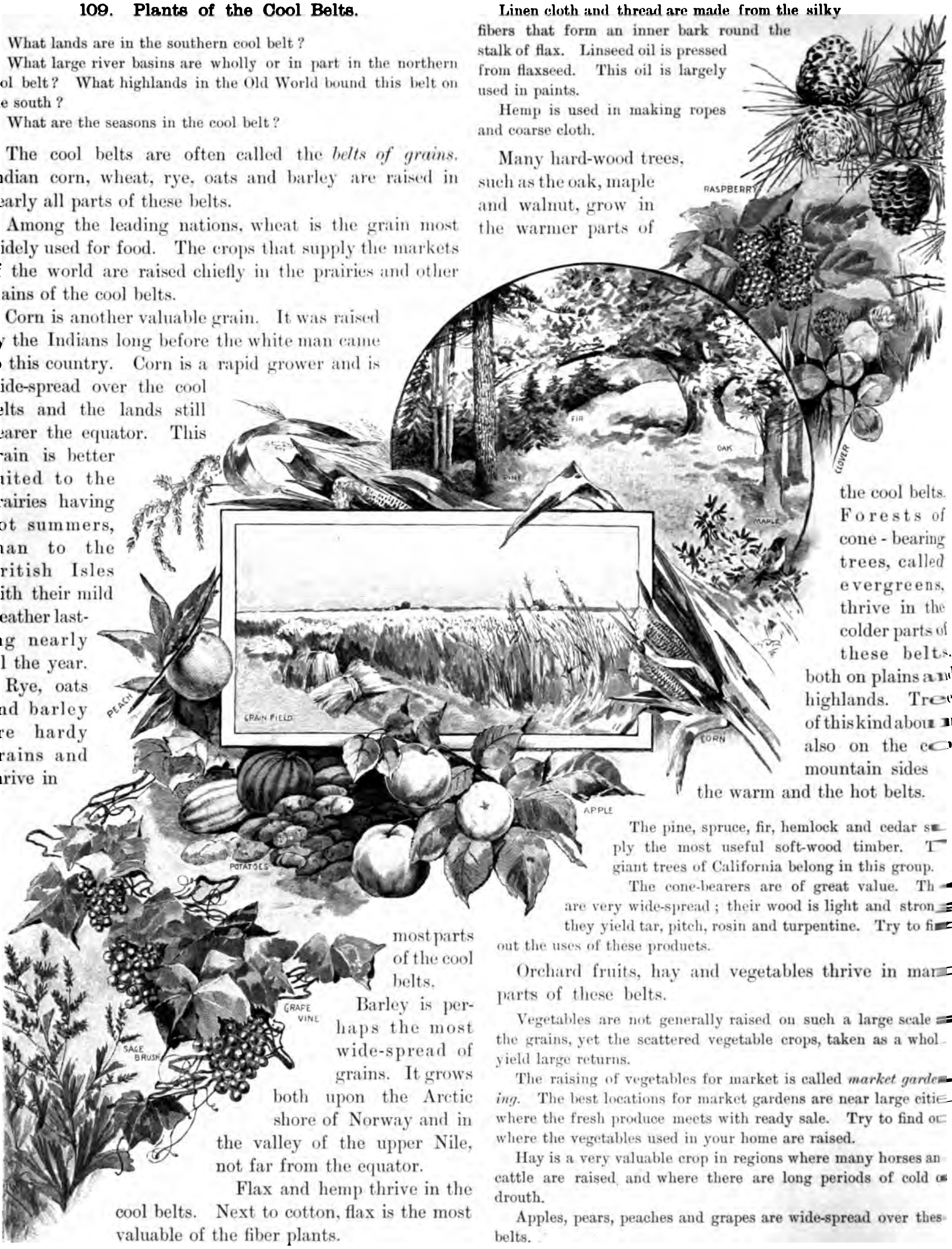
The thick foliage shuts out the drying sunshine from the lands in many parts of the hot belt. The rainfall being heavy, these lands become very wet and therefore unhealthful for white people.

## 109. Plants of the Cool Belts.

What lands are in the southern cool belt?

What large river basins are wholly or in part in the northern cool belt? What highlands in the Old World bound this belt on the south?

What are the seasons in the cool belt?



The cool belts are often called the *belts of grains*. Indian corn, wheat, rye, oats and barley are raised in nearly all parts of these belts.

Among the leading nations, wheat is the grain most widely used for food. The crops that supply the markets of the world are raised chiefly in the prairies and other plains of the cool belts.

Corn is another valuable grain. It was raised by the Indians long before the white man came to this country. Corn is a rapid grower and is wide-spread over the cool belts and the lands still nearer the equator. This grain is better suited to the prairies having hot summers, than to the British Isles with their mild weather lasting nearly all the year.

Rye, oats and barley are hardy grains and thrive in most parts of the cool belts.

Barley is perhaps the most wide-spread of grains. It grows both upon the Arctic shore of Norway and in the valley of the upper Nile, not far from the equator.

Flax and hemp thrive in the cool belts. Next to cotton, flax is the most valuable of the fiber plants.

Linen cloth and thread are made from the silky fibers that form an inner bark round the stalk of flax. Linseed oil is pressed from flaxseed. This oil is largely used in paints.

Hemp is used in making ropes and coarse cloth.

Many hard-wood trees, such as the oak, maple and walnut, grow in the warmer parts of the cool belts. Forests of cone-bearing trees, called evergreens, thrive in the colder parts of these belts, both on plains and highlands. Trees of this kind abound also on the cool mountain sides in the warm and the hot belts.

The pine, spruce, fir, hemlock and cedar supply the most useful soft-wood timber. The giant trees of California belong in this group.

The cone-bearers are of great value. They are very wide-spread; their wood is light and strong; they yield tar, pitch, rosin and turpentine. Try to find out the uses of these products.

Orchard fruits, hay and vegetables thrive in many parts of these belts.

Vegetables are not generally raised on such a large scale as the grains, yet the scattered vegetable crops, taken as a whole, yield large returns.

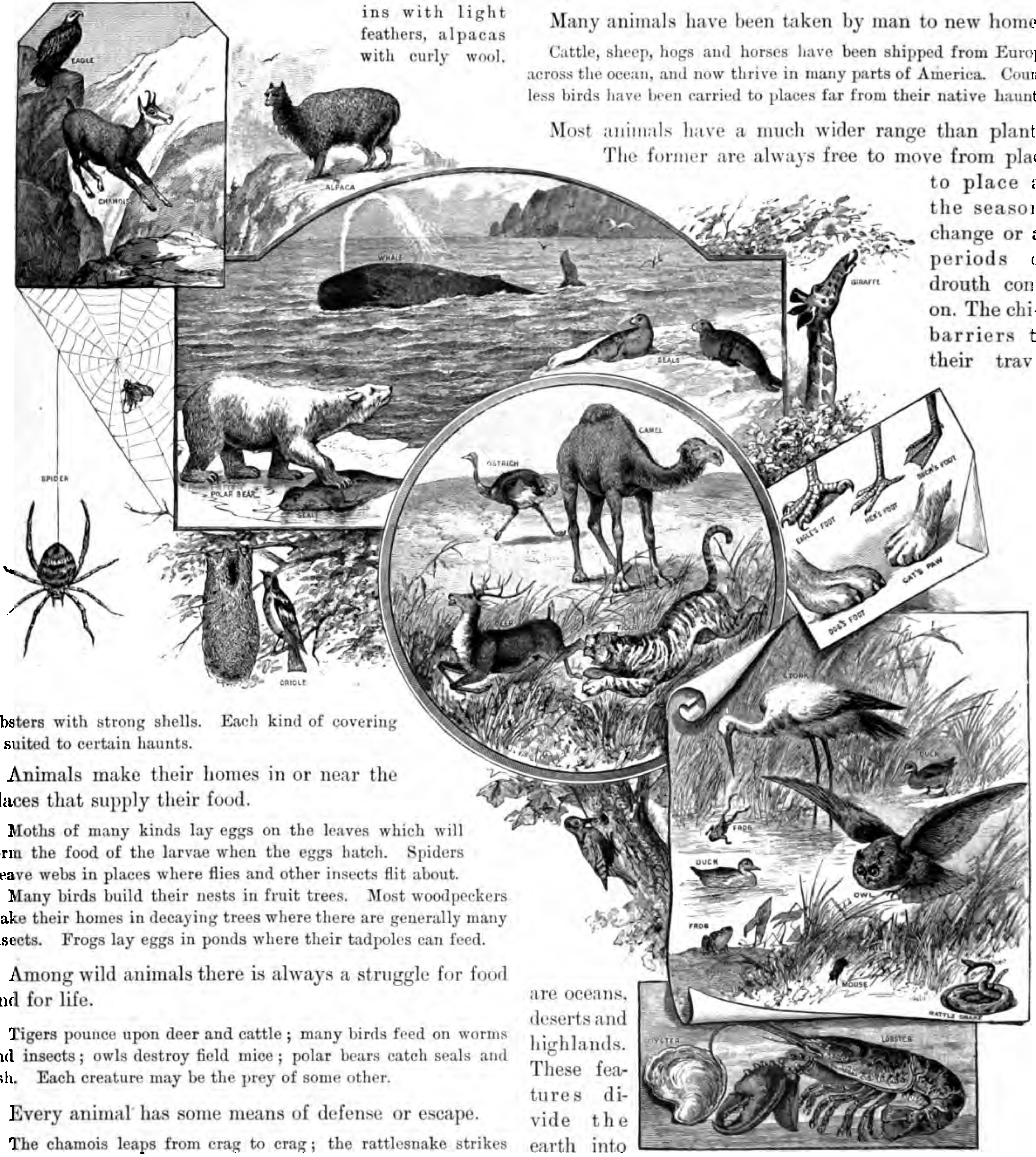
The raising of vegetables for market is called *market gardening*. The best locations for market gardens are near large cities, where the fresh produce meets with ready sale. Try to find out where the vegetables used in your home are raised.

Hay is a very valuable crop in regions where many horses and cattle are raised, and where there are long periods of cold or drouth.

Apples, pears, peaches and grapes are wide-spread over these belts.

Every kind of creature has the kind of covering that suits its native home.

**Whales that live in polar seas have thick layers of fat, or *blubber*, to keep the icy water from chilling their muscles.** Seals are covered with warm fur, robins with light feathers, alpacas with curly wool, lobsters with strong shells. Each kind of covering is suited to certain haunts.



Animals make their homes in or near the places that supply their food.

Moths of many kinds lay eggs on the leaves which will form the food of the larvae when the eggs hatch. Spiders weave webs in places where flies and other insects flit about.

Many birds build their nests in fruit trees. Most woodpeckers make their homes in decaying trees where there are generally many insects. Frogs lay eggs in ponds where their tadpoles can feed.

Among wild animals there is always a struggle for food and for life.

Tigers pounce upon deer and cattle; many birds feed on worms and insects; owls destroy field mice; polar bears catch seals and fish. Each creature may be the prey of some other.

Every animal has some means of defense or escape.

The chamois leaps from crag to crag; the rattlesnake strikes with poison fangs; the deer runs swiftly; the frog dives into water; the ostrich kicks and runs.

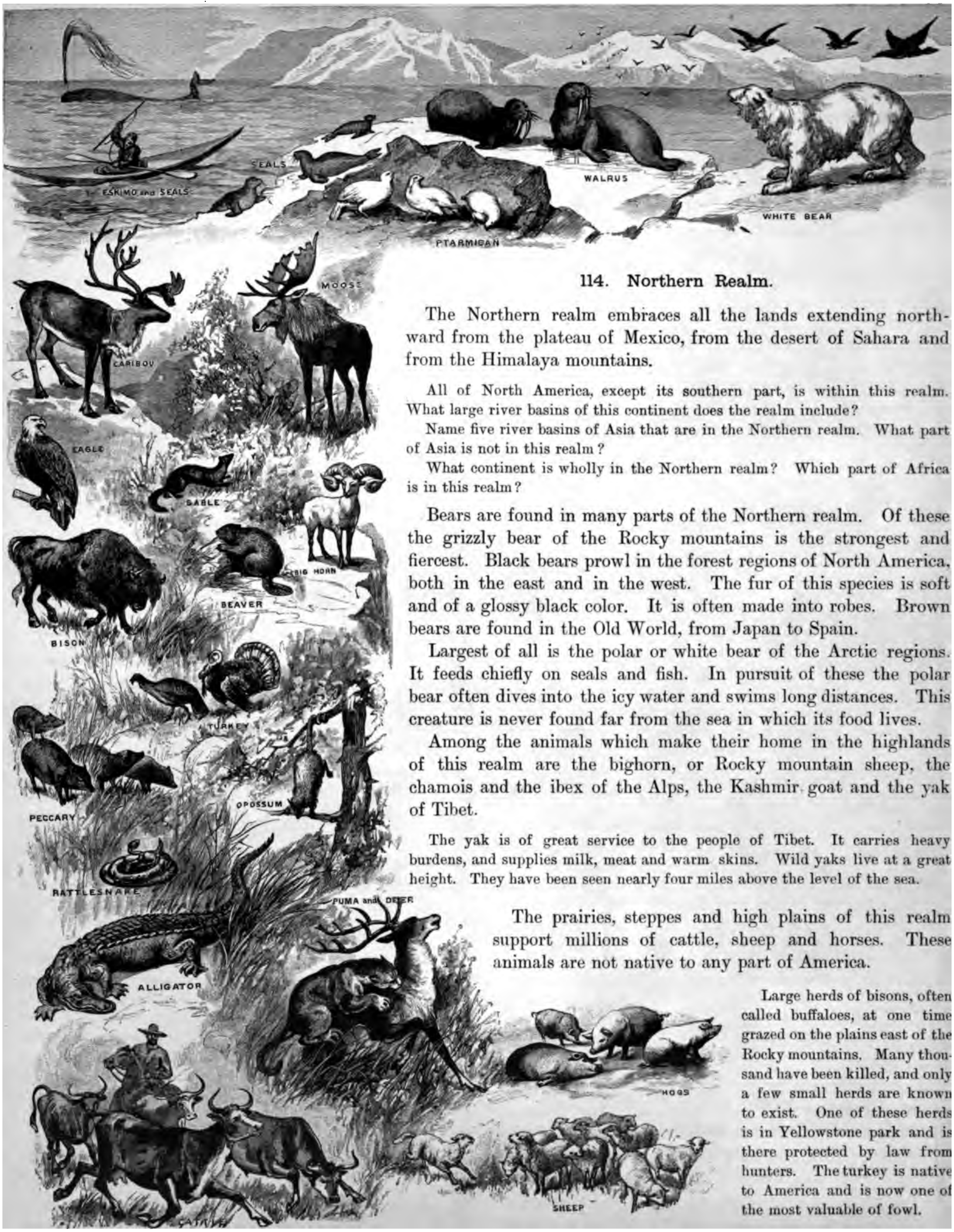
Nearly all animals have power to move about and seek new homes. There are places that animals cannot cross. They may be swift and strong, but they cannot live in regions that do not supply their food.

The warm parts of the Old World are the home of the elephant and the giraffe. What prevents these animals from reaching South America? Why cannot cattle cross wide deserts?

Many animals have been taken by man to new homes.

Cattle, sheep, hogs and horses have been shipped from Europe across the ocean, and now thrive in many parts of America. Countless birds have been carried to places far from their native haunts.

Most animals have a much wider range than plants. The former are always free to move from place to place as the seasons change or as periods of drouth continue on. The chief barriers to their travel are oceans, deserts and highlands. These features divide the earth into great *realms*, each having some groups of animals that differ from those of the other realms. Many kinds of animals in each realm are also found in other realms, for some can cross places that are barriers to others.



### 114. Northern Realm.

The Northern realm embraces all the lands extending northward from the plateau of Mexico, from the desert of Sahara and from the Himalaya mountains.

All of North America, except its southern part, is within this realm. What large river basins of this continent does the realm include?

Name five river basins of Asia that are in the Northern realm. What part of Asia is not in this realm?

What continent is wholly in the Northern realm? Which part of Africa is in this realm?

Bears are found in many parts of the Northern realm. Of these the grizzly bear of the Rocky mountains is the strongest and fiercest. Black bears prowl in the forest regions of North America, both in the east and in the west. The fur of this species is soft and of a glossy black color. It is often made into robes. Brown bears are found in the Old World, from Japan to Spain.

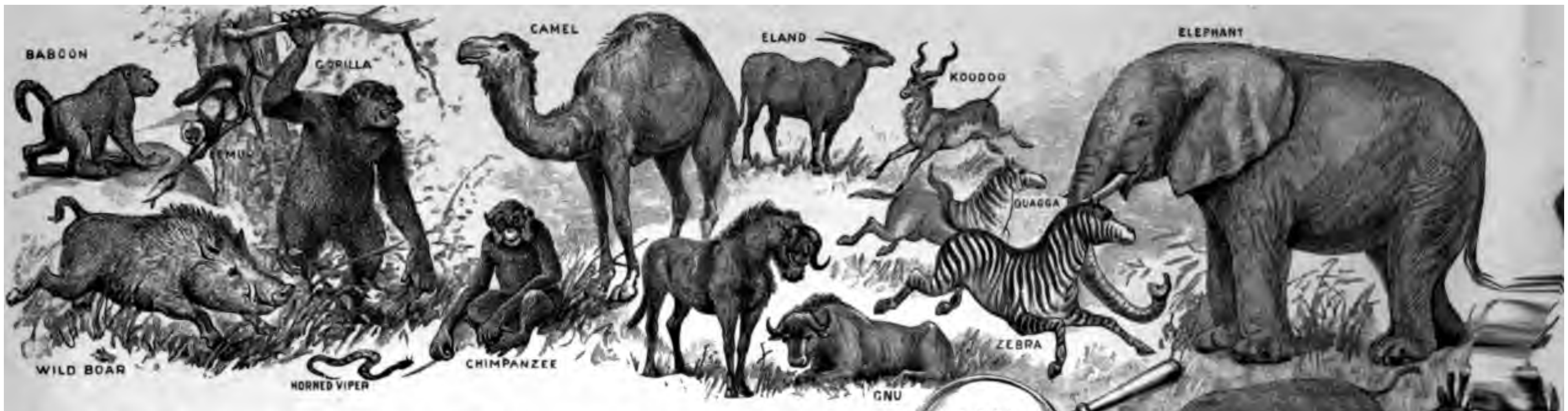
Largest of all is the polar or white bear of the Arctic regions. It feeds chiefly on seals and fish. In pursuit of these the polar bear often dives into the icy water and swims long distances. This creature is never found far from the sea in which its food lives.

Among the animals which make their home in the highlands of this realm are the bighorn, or Rocky mountain sheep, the chamois and the ibex of the Alps, the Kashmir goat and the yak of Tibet.

The yak is of great service to the people of Tibet. It carries heavy burdens, and supplies milk, meat and warm skins. Wild yaks live at a great height. They have been seen nearly four miles above the level of the sea.

The prairies, steppes and high plains of this realm support millions of cattle, sheep and horses. These animals are not native to any part of America.

Large herds of bisons, often called buffaloes, at one time grazed on the plains east of the Rocky mountains. Many thousand have been killed, and only a few small herds are known to exist. One of these herds is in Yellowstone park and is there protected by law from hunters. The turkey is native to America and is now one of the most valuable of fowl.



The walrus is a large animal of the seal family, and lives along the Arctic coasts. The walrus has strong ivory tusks that it uses to defend itself and to dig shellfish from the bottoms of bays. It is killed for its oil, ivory, hide and coarse flesh. Seals feed chiefly on fish that they catch with their sharp claws. They swim with great speed but are clumsy on the land. Some seals are valued for their fine fur. Many of these are killed on the Pribilof islands in Bering sea. Seals form a large part of the food of the Eskimos. Among the sea fowl which visit the Arctic shores in summer, to feed and to hatch their young, are eider ducks, geese and auks.

### 115. African Realm.

The African realm includes the peninsula of Arabia and all Africa except the region north of the Sahara desert.

This realm is the home of many man-like apes. Among these the fierce gorilla holds first place for size and strength. This species of ape is found near the west coast of Africa, not far from the equator.

The gorilla feeds mostly on the fruit of palm and banana plants. For a nest it weaves vines into rude hammocks or mats among thick branches. This strong beast is not found in any other part of the earth.

The chimpanzee lives in about the same region as the gorilla and also far inland near the upper Nile. Many other apes and monkeys are found in nearly all parts of Africa.

The vast barren tracts in this realm are the home of the camel.

The camel has a wide sole under the toes of each foot to prevent it from sinking into the soft sand. The nostrils can be closed at will, and veils of hair hang over the eyes to keep out the hot stinging sand which often blows over the desert.

The camels of the African realm have single humps on their backs. The camels of the desert region in central Asia have double humps.

Before the camel starts on a long journey, its master sees that the hump or humps are very large. These odd swellings are masses of fat. When the beast has gone for a long time without food, this fat nourishes the body.

For three or four days at a time, the camel will bear a heavy load across heated deserts, without drinking. The body is supplied with water from pouches, or water-cells, on the walls of the first stomach.

Camel's milk and flesh are used for food. The long hair that grows on the hump, neck and legs of the camel is made into cloth.

One species of elephant is found in Africa. Each year thousands of these beasts are killed for their ivory tusks.

**The lion and the leopard live in many parts of this realm. They prowl about the places in which they can pounce upon deer and other animals. Among the huge creatures that abound in this realm are the thick-skinned rhinoceros with horned nose, the tall giraffe with long neck, the giant ostrich with fine plumes and the dreaded crocodile with scaly armor.**

**The tsetse fly is about as large as the house fly and has almost the same colors as the honey bee. The home of this insect is in parts of central and south Africa. The sting of the tsetse fly is fatal to cattle, horses and dogs, but harmless to man.**

### 117. Australian Realm.

**The Australian realm includes Australia, Papua, New Zealand and many groups of small islands in the Pacific o**

**Most of the animals in this realm differ widely from those in other parts of the world. Many have pouch carrying their helpless young. These pouches are made by folds in the skin on the under side of the body.**

**The name *kangaroo* is given to several species of pouched animals. Some of these are about the size of Others are as large as men. Large kangaroos are hunted for their skins, from which fine soft leather is made. animals travel very swiftly, by making long leaps.**

The emu is related to the ostrich. The plumage of the emu is long and hair-like, but there are only the rudiments of wings. This bird cannot fly, but it runs with great speed. The emu is hunted for the oil in its skin.

The apteryx of New Zealand belongs to the same order of birds as the emu, the ostrich and the rhea. The duck mole (*ornithorynchus*) of Australia lays eggs and sits on them, but it is not a bird. The duck mole has soft brown fur and may often be seen in ponds and streams. It feeds mostly on insects and worms that live in the water.

The *echidna* is covered with sharp spines. It feeds on ants and other insects. This animal has no teeth, but from a long snout it runs out a sticky tongue to seize its food. The echidna lays eggs but does not sit on them. The eggs are hatched in its warm pouch, and there the little animals also remain till they grow strong.

The Australian realm abounds in black swans, lyre birds, parrots, brush turkeys, pigeons, ducks, geese and other kinds of birds.

Sheep and cattle are not native to Australia, but are now counted there in millions.

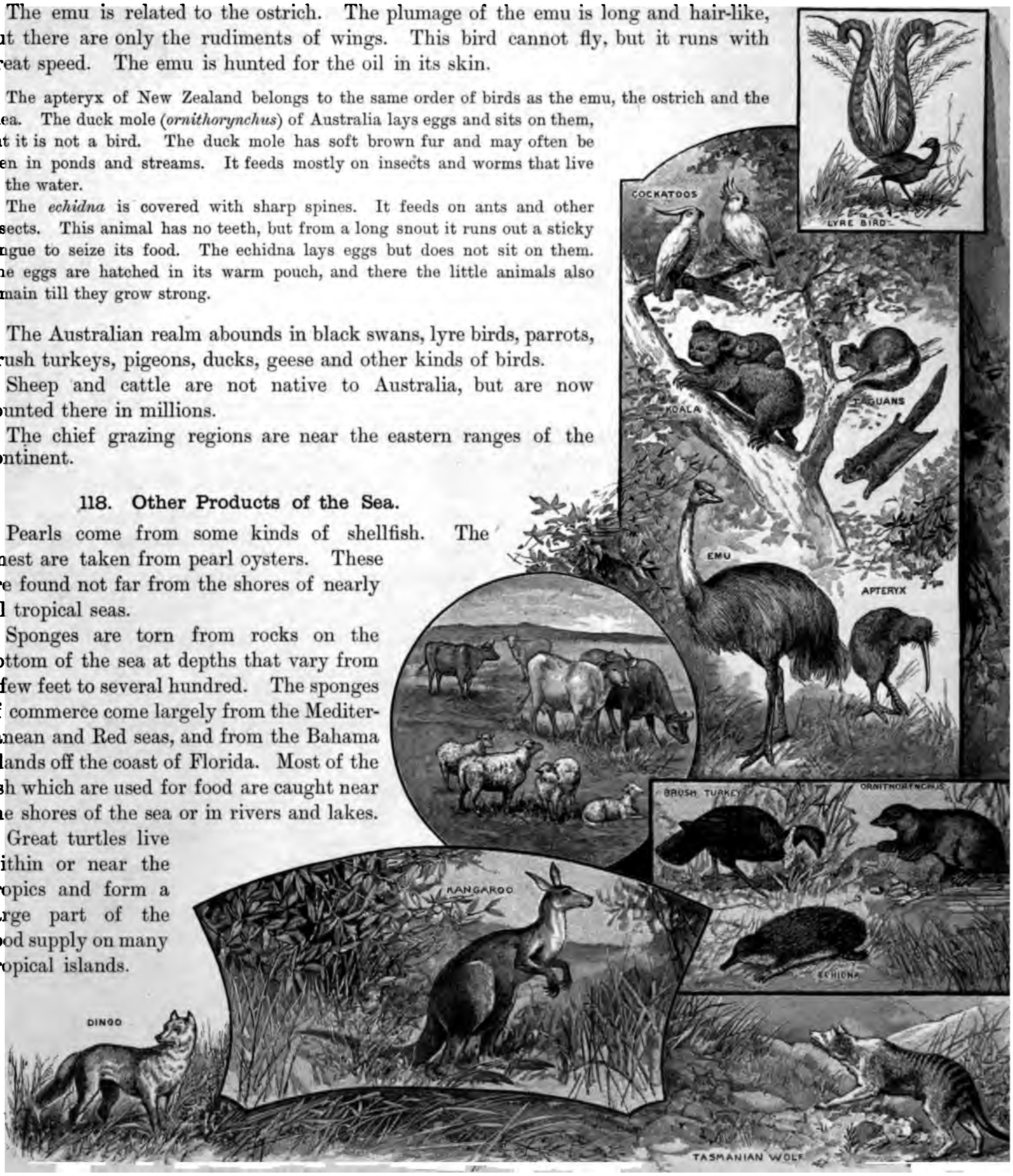
The chief grazing regions are near the eastern ranges of the continent.

### 118. Other Products of the Sea.

Pearls come from some kinds of shellfish. The finest are taken from pearl oysters. These are found not far from the shores of nearly all tropical seas.

Sponges are torn from rocks on the bottom of the sea at depths that vary from a few feet to several hundred. The sponges of commerce come largely from the Mediterranean and Red seas, and from the Bahama islands off the coast of Florida. Most of the fish which are used for food are caught near the shores of the sea or in rivers and lakes.

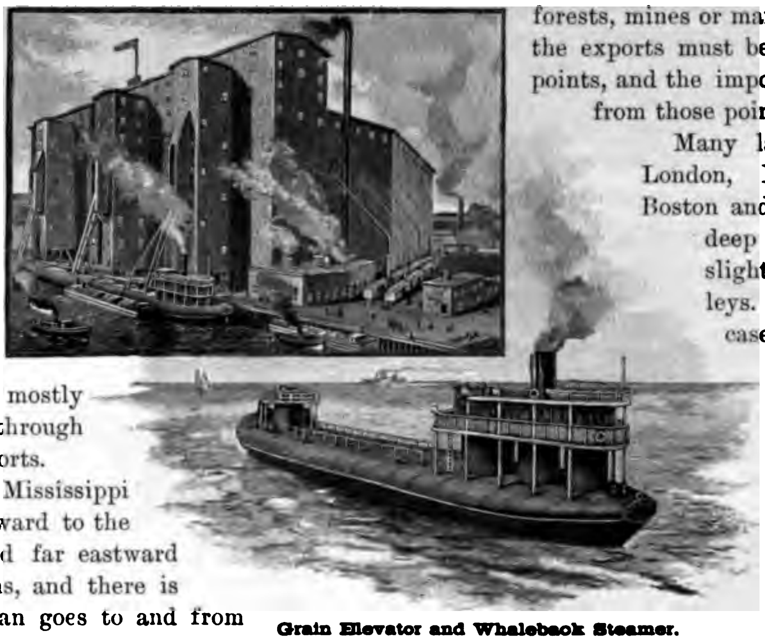
Great turtles live within or near the tropics and form a large part of the food supply on many tropical islands.

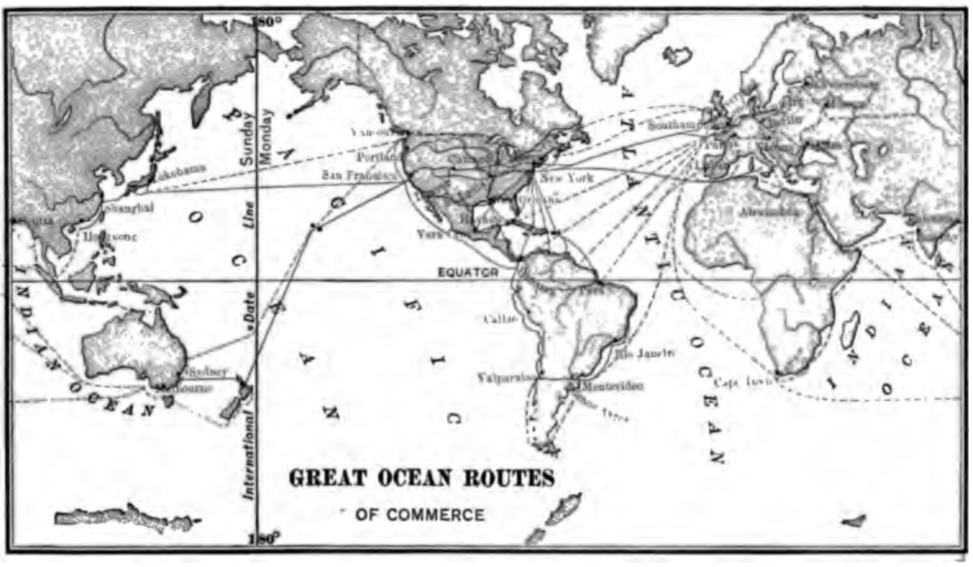


Lakes and inland seas that lead in the direction of trade centers are often of greater service than rivers.

The water way along the Great Lakes is of more importance than any other lake or river route in the world. The rapid growth of trade along this route is due to many causes, among which are the following: The grainfields, pastures, coal fields, oil wells, iron mines and large manufacturing cities of our country are chiefly in the northern half; the foreign trade of this region is carried on mostly with countries of Europe; the goods pass through New York, Boston and other large Atlantic ports.

In this immense east-and-west trade, the Mississippi system is of little use, because it leads southward to the gulf of Mexico; but the Great Lakes extend far eastward from the very heart of the producing regions, and there is consequently more shipping on these lakes than goes to and from any seaport in the world. Lines of steamers connect all the large lake ports, — for example, Chicago with Milwaukee, Detroit, Buffalo and other cities; Detroit with Cleveland; Buffalo with Duluth. Small vessels from the Great Lakes can reach the ocean also, by going down the St. Lawrence river and through the short canals which have been built past rapids in this river.


Grain Elevator and Whaleback Steamer.



The oceans form the main highway of trade between distant nations. The sea spreads in one vast body around the continents, so that a ship can sail from any one of the oceans to all the others.

Elevated Railroad, New York.

Seaports handle freight for ocean commerce. The best ports are on deep and spacious harbors sheltered from gales and storm-waves. The largest ports grow where they can most easily handle exports and imports. Such cities are built as near as possible to the producing regions, — whether farms, forests, mines or manufacturing cente the exports must be taken to the sl points, and the imports must be dist from those points.

Many large seaports, s London, New York, Liv Boston and San Francisco, deep harbors formed slight drowning of ri leys. The harbors are i cases some distance at the head drowned part valleys. Tida rents flowing out of the rive vessels to ent clear from the

Thus, Lon seventy miles f mouth of the T — 70 miles inland towards the farms and workshops of bus land. Montreal is about 1000 miles up the drowned va the St. Lawrence. Philadelphia and Ba are near the heads of two bays in slightly-d valleys. The nearer a steamer can go to the which supply or receive freight, — the ne the producer or the consumer, — the chea rates of transportation are.

The largest seaports of our country ar the northeast coast. They have grown up they can most easily carry on trade bot Europe and with the principal producing of the United States. About one half the trade of our nation passes through the gre of New York.[1] Boston ranks second to tha Philadelphia and Baltimore also have foreign and coastwise trade.

Northern and Southern Hemi

The larger map on this page shows the principal routes followed by steamers, and to a certain extent by sailing vessels. The dotted lines indicate routes followed by foreign vessels. The solid lines show the principal routes of steamers owned in the United States.

Name six foreign ports that can be reached by American lines of steamers.

England, with her extensive manufactures and her numerous colonies, has grown to be the center of the world's ocean commerce.

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[1] The *port* or *customs district* of New York embraces the city of New York, together with Brooklyn, Jersey City and adjacent places on New York bay.

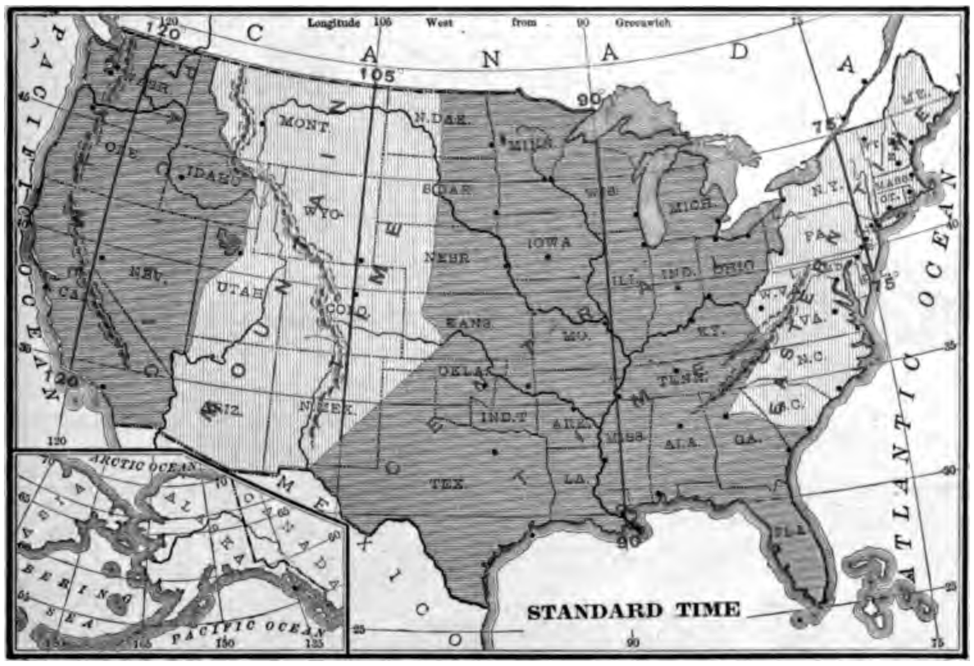
Ocean cables, or lines of telegraph under the sea, are a valuable aid to commerce. When a steamer sails with freight for a foreign port, agents abroad can be cabled when to expect it and what to do with it. Consuls also can cable for help in times of trouble, and important news of all kinds can be sent along these wires laid deep in the sea.[1]

The regular mails and the telegraph lines on the land are of so much assistance to trade that when storms blow down the wires and block the mail trains, the wholesale trade almost ceases. The telephone also has recently taken an important place in the world of commerce.

### 123. Time Belts and International Date Line.

As the earth rotates from west to east, Boston is turned into the sunlight about an hour earlier each morning than Chicago. After sunrise in Chicago, darkness continues for more than two hours in San Francisco. Can you tell why?

How many degrees are there in a circle? In how many hours does the earth rotate 360°? How many degrees does the earth rotate in one hour? The United States, exclusive of Alaska, extends from the 67th meridian almost to the 125th. About how many hours elapse each day while the midday sun is over some part of our country?



When it is midday along the 75th meridian, what time is it along the 90th? — Along the 105th? — Along the 120th? How far apart are these meridians? Which is nearest New York? Which is nearest Chicago? Which is nearest San Francisco?

If all clocks were set by the midday sun, calling midday *twelve o'clock*, the time would differ in cities east or west of one another. A watch, though correct in one of these places, would be wrong in all others. A traveler could not then rely on his watch, for exact railroad time.

In order to secure uniform time over large districts, railroad companies have divided the country into four belts, each of which takes its time from a certain meridian. Timepieces in the Eastern belt are set by the true or *mean solar* time on the 75th meridian. All timepieces therefore in Boston, New York, Philadelphia, Washington, Richmond, and all other places in this belt, are regulated to agree.[2]

In like manner, all places in the Central belt, the Mountain belt and the Pacific belt take their time from the meridians of 90°, 105° and 120° respectively. As these meridians are 15° apart, the time in each belt differs exactly one hour from the time in the belt on either side.

The time in general use over a belt is called *standard time* or *railroad time.*

In going from one time belt into another, travelers set their watches forward or back *one hour.* Traveling eastward, which way should the hands of a watch be moved when another time belt is reached?

The borders of the time belts are made irregular to favor railroad companies that wish to use uniform time over very large areas. Which of these belts is the widest? How many hours difference in time is there between Boston and San Francisco?

*International Date Line.* The common day, often called the ***civil day,*** lasts from midnight to midnight, — twenty-four hours. In order that the civil day may have the same number or *date* the world around, the leading nations have agreed to use the date of the days as they begin on the 180th meridian.

For example, the fourth day of July begins on the 180th meridian at midnight following the third of July. At that time it is midday of the third of July in Greenwich; and six o'clock in the morning of the same day in New Orleans, 90° W. Then as the earth rotates towards the east, both London and New Orleans are turned into darkness, the one six hours ahead of the other. As soon as it is midnight in London, that city begins to count the new date of July 4th; six hours later New Orleans has its midnight and then its fourth of July begins.

Thus it is with every city, — its dates are counted from midnight to midnight, and each day takes the same date as that given to the latest new day on the 180th meridian. We may think of the new date as traveling westward with the midnight. This date is given to each place as soon as the midnight reaches it. When midnight again occurs on the 180th meridian, another date begins its journey round the earth.

When vessels cross the 180th meridian, they either drop a day or add one to the calendar. As the new date begins on that line, a vessel sailing eastward across the line goes out of the area having the new date and must therefore go back a day. Sailing westward, the vessel enters the area having a new day and must therefore add a day to the calendar. Thus when sailing eastward across the line, Monday is dropped for Sunday; but sailing westward over the line, Saturday at once gives place to Sunday.

The meridian of 180°, at which all new civil days begin, is called the "International date line."

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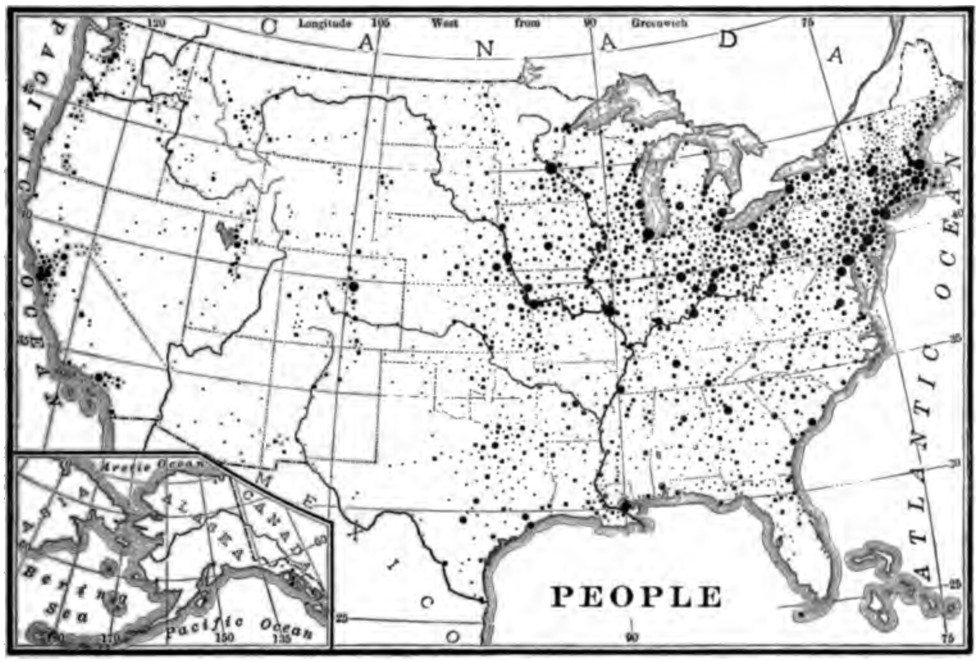
[1] The large commercial map of the world, in the *Supplement*, shows the routes of the cables.

[2] The correct time is sent over the country by telegraph from the United States Naval Observatory, Washington. On page 123 there is a picture of this observatory.

Southern plains. Thousands of acres were planted with cotton, and the region was very rapidly growing in wealth and population.

Until about a century ago, cotton fiber was separated by hand from the seeds. This was slow work, for a person could pick only about a pound of fiber in a day. The price of cotton was therefore high, and poor people could not afford to use much cotton cloth.



**Note.**—The dots on the above map show the location of cities and large towns. The largest cities are indicated by the largest dots. The star on the map shows the center of population according to latest census.

At length a machine was made to separate the fiber from the seeds. The machine was called a *cotton engine*,—now shortened to *cotton gin*. It has saw-teeth that draw the fibers through slits too narrow to admit the seeds. A large cotton gin can clean a thousand pounds of cotton in a day.

Before the cotton gin was invented, machines had been made for spinning or twisting fibers into thread and for weaving the thread into cloth. There was a large and growing demand for cotton. The new machine made it possible to supply this fiber without great expense and thus led to the planting of cotton in all the states of the Southern plains. Cotton has for many years been the leading crop in that region.

Market in "Chinatown," San Francisco.

Soon after the first English colonists came to this country, they received a cargo of slaves from Africa. Slavery spread with the growth of the country, but the slaves proved to be of greatest service in the cotton and the tobacco fields of the South. The invention of the cotton gin created a great demand for slave labor in the cotton fields, and people of the black race were brought in shiploads from Africa.

At length all the slaves in our country were set free, and most of them made their homes on the Southern plains where they had worked and where many of them had been born. One tenth of the people in the United States are Negroes.

About fifty years ago, gold was discovered in California, and many thousand people flocked there in search of fortunes. Some toiled across the dry Western plains and the Rocky Mountain highland. Others reached the gold fields by way of the isthmus of Panama,—going by water to and from that neck of land. Shiploads of gold-seekers went round Cape Horn and thence up the Pacific coast to San Francisco. Gold in the Sierra Nevada led to the settling of California; but products of far greater value are now taken from the grainfields, the vineyards, the fruit groves and the pastures of that state. Silver and gold have also been found in other parts of the western highland, and towns and cities have grown up in many places near the rich mines.

In 1776 the population of the United States was less than 3,000,000. Now it is about 70,000,000,—nearly one twentieth of the total population of the world.

The rapid growth of our country has been largely due to the great number of immigrants who have come from Europe,—mainly from the British Isles, Germany, Italy and Russia.[1]

Which coast of the United States is the most thickly settled? Why?

Which has the greater population,—the prairie region or the western highlands? What part of our country is the most thickly settled? Why?

Where are the cities larger,—on the Great Lakes or on the gulf of Mexico? Which part of the Mississippi basin is the most thickly settled? Why?

Why are there so few cities or towns on the Western plains? In the Great Basin? On the Columbia plateau? On the Colorado plateaus? In the great peninsula of Alaska?

Let us now learn how our nation is governed.

## 125. Government.

The highest law of the nation is known as the *Constitution of the United States*. This written law, or body of laws, was adopted in Philadelphia, in 1787,[2] by men chosen from the thirteen states. It has since received several additions, or *amendments*.

The Constitution outlines the form of our government; names the various offices; indicates how the offices are to be filled; defines the authority of the officers; limits the power of the law-makers; provides for a Supreme Court to decide questions that may arise as to the powers of the national government; and, in general, forms the highest law of the land.

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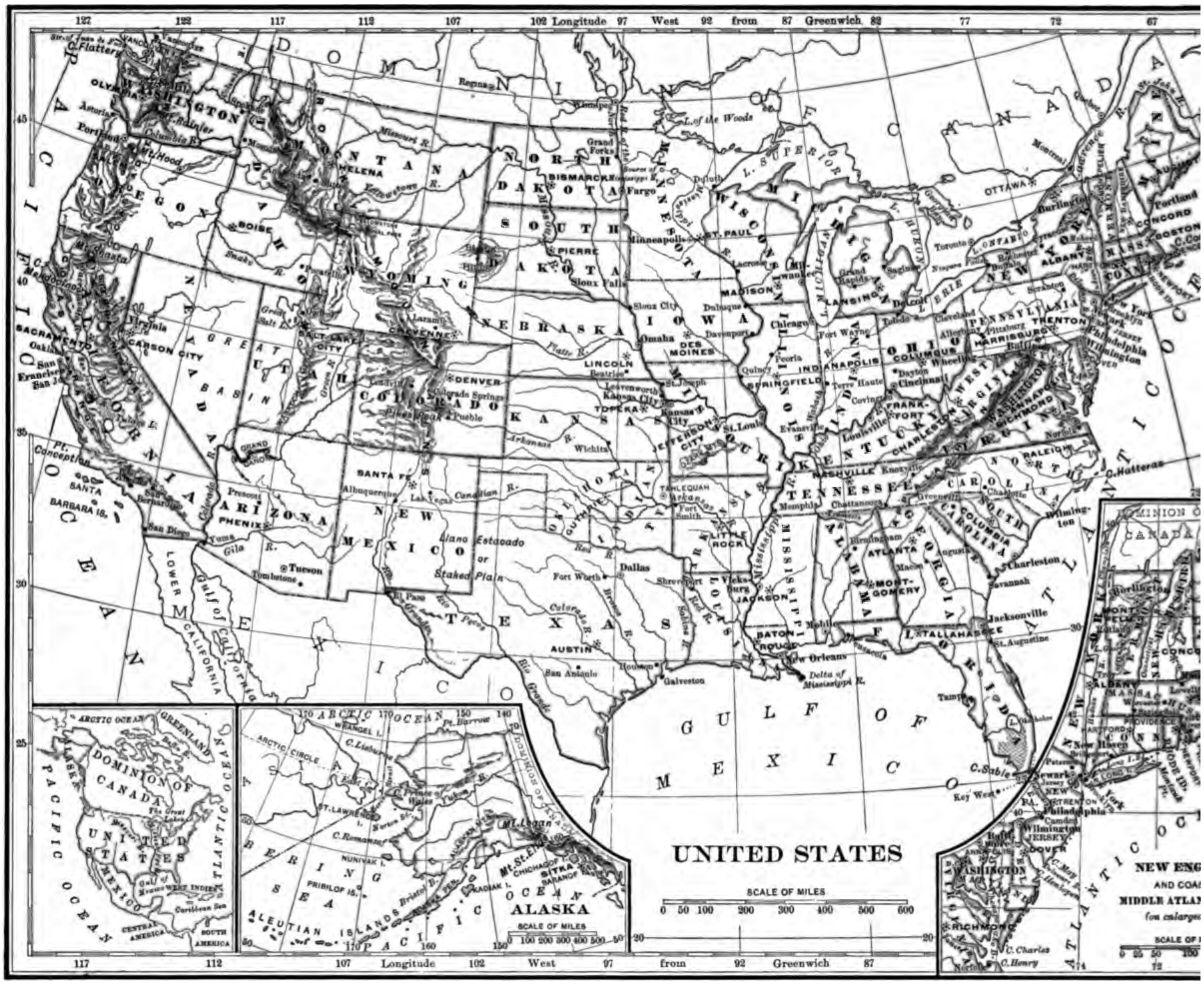
[1] There are also about 100,000 Chinese in the United States. Their largest colony is in San Francisco.

[2] The Constitution went into effect on March 4, 1789.



of Representatives, its Supreme Court, its chief executive officer called a *Governor*, — as well as other officers.

Some portions of our country do not belong in any state, but are known as *territories*. Their governors and judges are appointed by the President, with the consent of the Senate, but the people of each territory elect their other officers. The territories have also their own legislative bodies.

There are now five territories, as follows: Alaska, Arizona, Indian Territory,[1] New Mexico, Oklahoma. From time to time, as the territories increase in population, they are admitted into the Union as states.

The city of Washington, with its suburb Georgetown, is on a tract of land set apart for the use of the government. This tract is known as the *District of Columbia*. It is neither a state nor a territory, but is under the control of Congress.

Congress meets in Washington, the Supreme Court sits the President resides in that city, and the members of the C have their offices there.

The United States has grown to be the foremost r lic and the wealthiest nation in the world.

### 126. Map Studies.

Bound the United States. Bound the state in which you Which states border on the Atlantic ocean? Which of states contain no part of the coastal plain?

What state in the New England highland has no sea Where are the White mountains? — The Green mountains which states does the piedmont belt reach the coast?

Which of the Great Lakes border on New York? What between that state and Vermont?

Name the river between Pennsylvania and New Jersey. states are on Delaware bay? — On Chesapeake bay? Nan states which border on Lake Erie. Which are separated Potomac river? The city of Washington is in the Dist Columbia; on what river is it built?

What states are grouped around the Carolina highland? of these are partly in the piedmont belt? Between what

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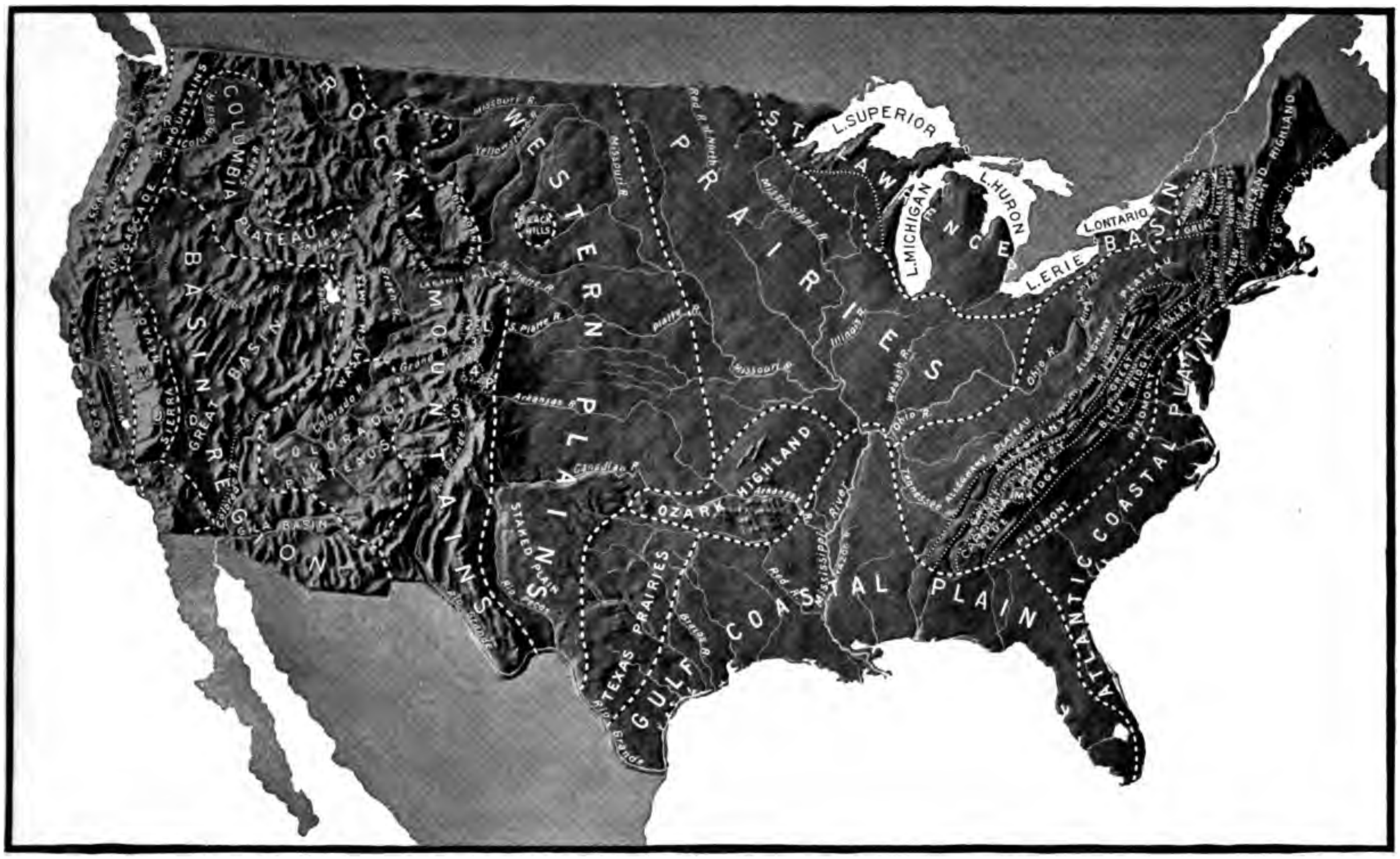
[1] Indian Territory differs from the other territories in not having a governor appointed by the President. This territory has been set apart as a home for certain tribes of Indians, and the national government has little to do with it.



Copyright, 1895, by Alex E. Frye.

**Key to Relief Map on pages 34 and 35.**

does the Savannah river flow? What states are crossed by the divide between the Atlantic and the Gulf coastal plains?

Name the states which border on the gulf of Mexico. In which of these is the Mississippi delta? What river separates Texas from Mexico? Between which of the Gulf states does the Mississippi river flow?

In what state does the Mississippi rise? Name the states along the east bank of that river; — along the west bank. Between what states does the Ohio river flow? Which of these states are wholly or in part in the Alleghany plateau?

Name the states which border on Lake Michigan; on Lake Superior. Which of the Great Lakes partly surround Michigan? Which states are partly in the St. Lawrence basin and partly in the Mississippi basin?

What two large rivers are near the southern and western borders of the prairies of the upper Mississippi?

Which states are partly in the prairies and partly in the Western plains? Which states are crossed by the Rocky mountains?

Name the two states that are almost wholly in the Basin region. What three states include the Columbia plateau region? What states are crossed by the Cascade range? In which state is the Sierra Nevada? Name the states lying along the Pacific coast?

Which states border on Canada? Which states and territories are next to Mexico? Name two territories crossed by the Arkansas river.

Which is the largest state in our country?

What bodies of water partly surround Alaska? What country is on the east of that territory? Where are the Pribilof islands?

## 127. Climate, — Temperature.

What belts of heat cross the United States? How do the seasons on the land in these belts differ from the seasons over the oceans on the east and west? *See lesson 26.*

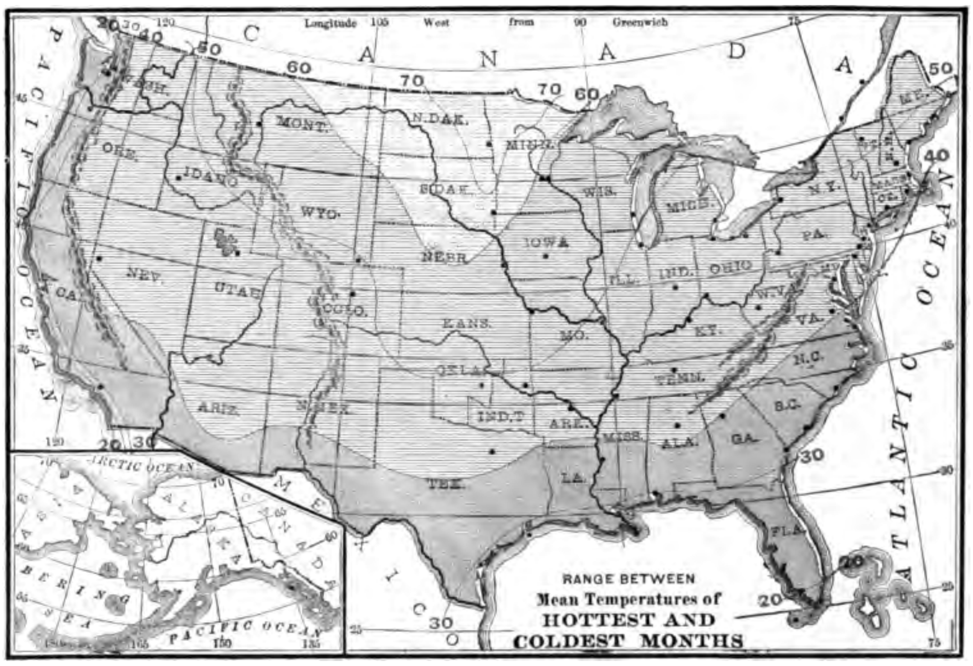


**CHART A.** — The above map shows that the greatest difference between January and July temperature is found on the northern part of the prairies and Western plains. There is less difference along the southern boundary and western coast.

At about what part of the distance from the equator to the pole is the mouth of the Mississippi? — The middle of Lake Huron? What does this show about the location of our country?

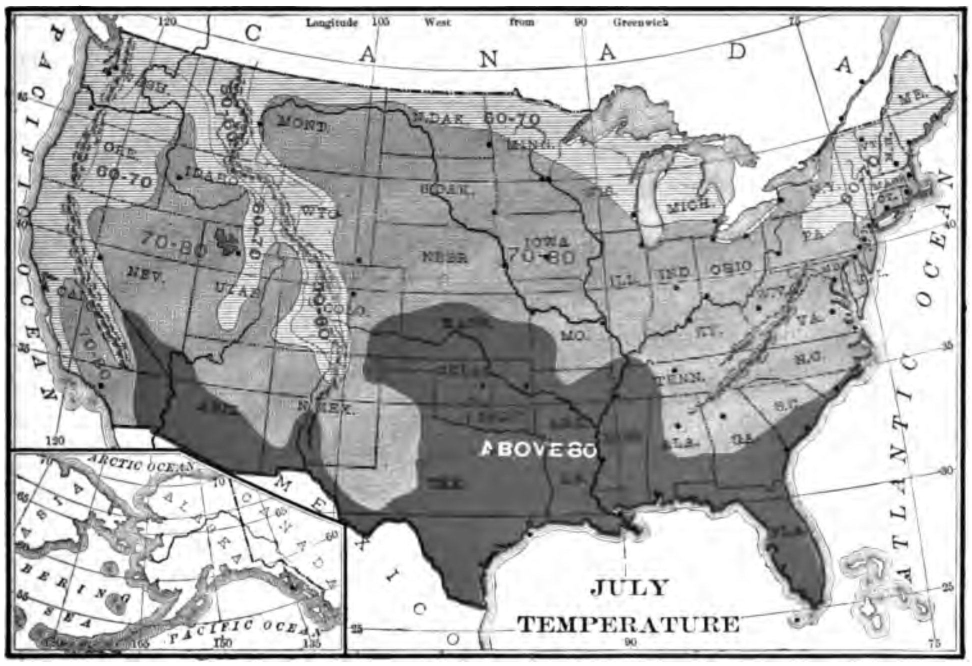


**CHART B.** — The greatest heat reaches northward in the middle of the country. The cooler regions are along the northern boundary, on the mountains, and along the western coast.

Our country lies between the steady heat of the equatorial regions and the extreme seasons of the polar cap.

From winter to summer, the change in the length of day and the strength of sunshine makes a great change in temperature over our country, but greater in the north than in the south. In winter the rivers and most of the lakes in the northern part of the United States are frozen; the snow-caps of the mountains reach far down into the valleys, and even the lowlands are sheeted over with snow that spreads farther south as the winter season advances.

As the days lengthen and the sunshine becomes stronger, the snow and ice melt away. Plant and animal activity begin again.

In what part of our country is the change of temperature from January to July the greatest? *See chart A, page 127.*

The change from winter cold to summer heat in our northern interior is very great for three reasons: first, — the winter sun is low and the daylight short, but the summer sun is high and the daylight long; second.— the temperature of the land surface changes much more rapidly than that of the sea surface; third,— although the coastal regions feel the tempering effect of winds from over the sea, yet the far-inland regions do not feel that effect, not only because the land is so broad, but also because high mountains lie along the western side in the path of the westerly winds.

During the long winter nights in the north-central part of our country, when the calm dry air rests on the broad sheet of snow, the temperature may fall to 40° or 50° below zero. In extreme cold, spirit thermometers are used; for mercury freezes at 39° below zero.

Although the winters in this district are so severe, the temperature rises rapidly in spring. There the long days of summer ripen great crops of wheat even northward in Canada. Cattle that can barely survive the winter climate find abundant pasturage in summer on the grassy plains. The noonday heat may then reach 90° or 100°, even at our northern boundary.

What is the difference of temperature between the Gulf coast and the northern part of Minnesota in January? — In July? *See charts B and C.*

The contrast of temperature between our southern and northern boundaries is very strong in winter, but slight in summer. Many plants that live only through the warm season thrive from the Gulf to the Great Lakes, but longer-lived plants that cannot survive cold winters are found only in the south.

The range of temperature from summer to winter on the Pacific coast is small (*see chart A*), because the westerly winds from over the broad Pacific temper the climate. They are warmer than the land in winter, but cooler in summer. As these westerly winds blow across our country, they gradually take the temperature of the land over which they move. Thus they carry the great heat of summer or the severe cold of winter out from the interior to the east coast. The changes of seasons on this coast are much stronger than on the western coast.

The great difference of temperature between the northern and southern parts of our Atlantic coast is partly the effect of the ocean currents. Off this coast the warm Gulf stream and the cold polar or Labrador current approach each other and tend to bring unlike temperatures together. The effect is felt on the coast whenever the winds blow inland. No polar current reaches our western coast.

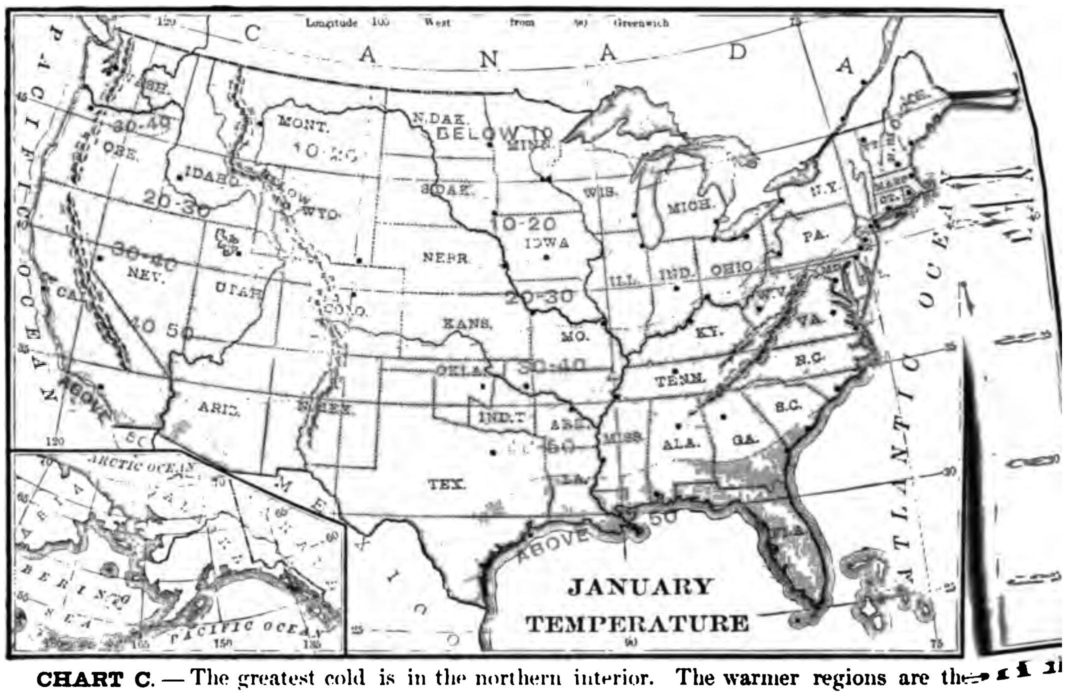
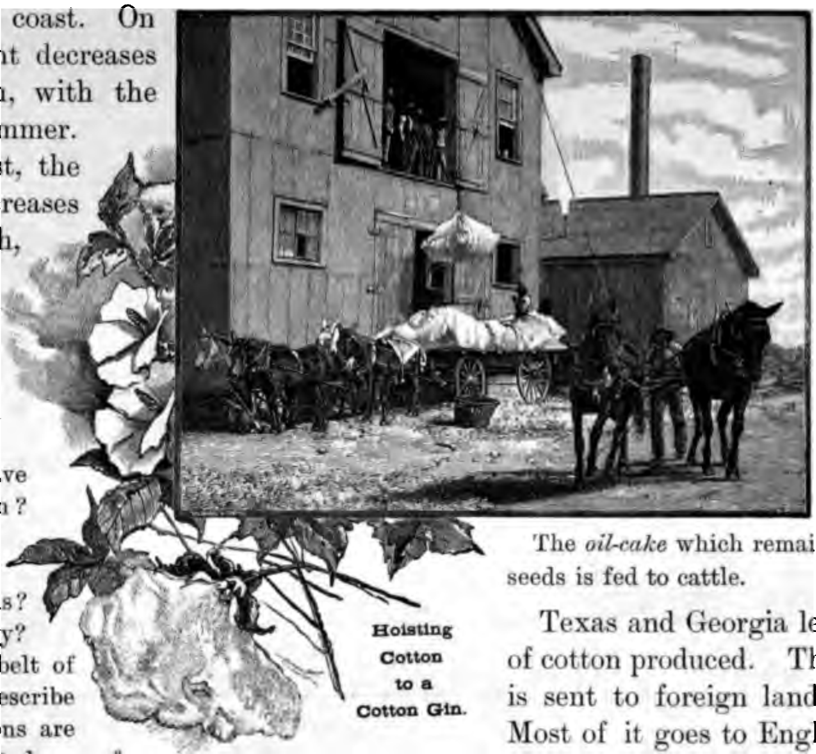


**CHART C.** — The greatest cold is in the northern interior. The warmer regions are the western coast, the southern boundary, and the southeastern coast.

**In Florida the rainfall is greatest in summer, when the sea-winds blow toward the warm land. In winter the winds tend to flow outward from the cold interior. The rainfall of our eastern coast is therefore doubly unlike** that of the western coast. On the former, the amount decreases from south to north, with the heaviest rains in summer. On the western coast, the amount of rainfall increases from south to north, with the heaviest rains in winter. *See charts D and E.*

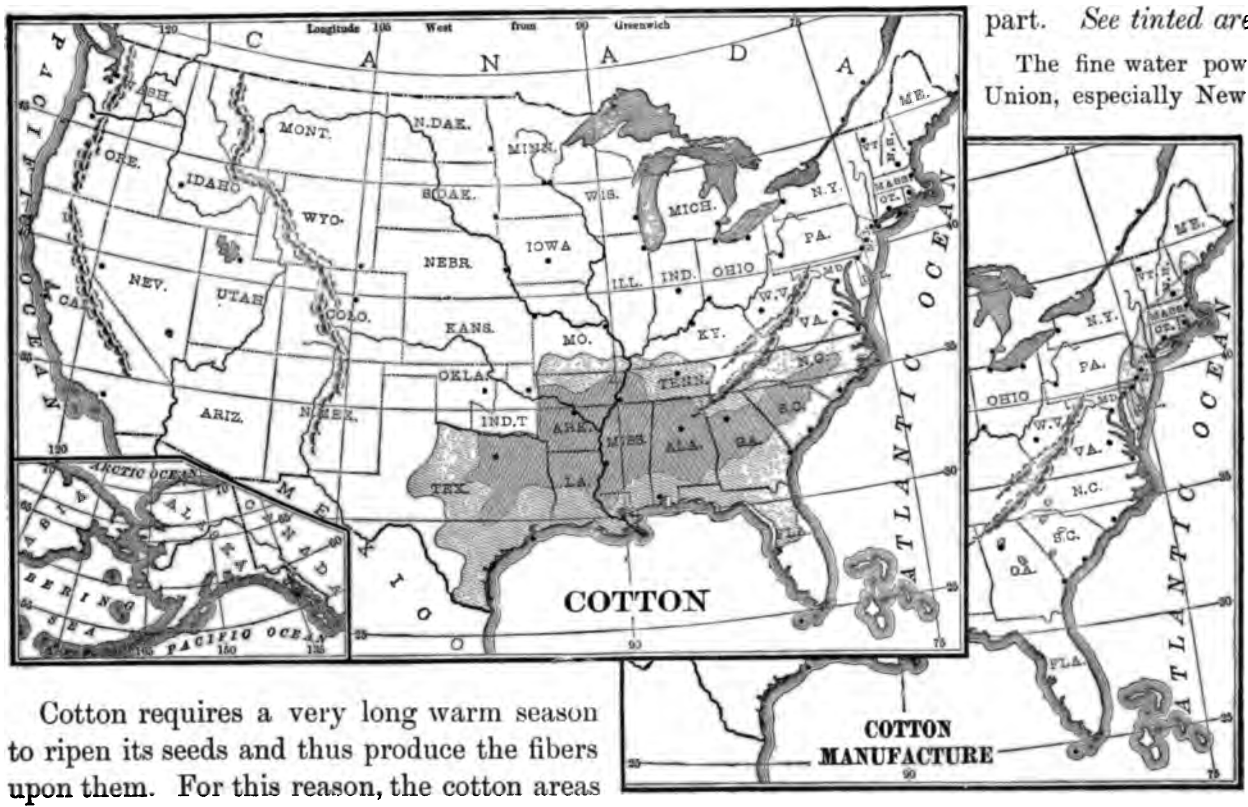

Hoisting Cotton to a Cotton Gin.

## 129. Cotton.[1]

What lands that we have studied produce cotton? *See lessons 53, 54, 73 and 88.* Which heat belt crosses each of those lands? Is it a wet or a dry country?

Where is the cotton belt of the United States? Describe its surface. What regions are partly included in the tinted area of the *Cotton* map? What are the seasons of this cotton belt? From over what part of the sea do its rain-bearing winds blow?

Name some of the other products of the cotton district of our country. *See lessons 53 and 54.* Tell some of the uses of cotton.



Cotton requires a very long warm season to ripen its seeds and thus produce the fibers upon them. For this reason, the cotton areas **are found in the hot and the warm belts, but only in the parts having plentiful rains.**

**The best grade of cotton grows on the low sandy islands along the coast of Georgia and South Carolina. This is known as *Sea-island* cotton. It has fine fibers that are long and strong. Most of the Sea-island cotton is sent to** the mills of England, to be woven into cloth.

After cotton is picked from the plants, it is put into cotton gins to separate the fibers from the seeds. The fibers are then pressed into bales and are ready for market. This is the *raw cotton* from which thread and cloth are made.

A valuable oil is pressed from the seeds of cotton. This is known as *cotton-seed oil.* It is used in making soap and other articles. Much of the oil is refined and sold under the name of "olive oil," but the real olive oil is made from the olive fruit.

The *oil-cake* which remains after the oil is pressed from cotton seeds is fed to cattle.

Texas and Georgia lead all other states in the quantity of cotton produced. The chief ports through which cotton is sent to foreign lands are New Orleans and New York. Most of it goes to England, Germany and France.

Savannah, Ga.; Galveston, Tex.; Norfolk, Va.; and Charleston, S. C., have a large export trade in cotton.

The great centers of cotton manufacture in the United States are the numerous cities and towns in the northeast part. *See tinted area on the map.*

The fine water power gave this portion of the Union, especially New England, an early start in manufacturing. There the rivers, when cutting through gravel beds in their valleys, have reached rocky ledges and have therefore formed falls or rapids. *See lesson 45.* Steam has now largely taken the place of water power, but hundreds of mills with their skilled workmen and costly looms still hold the cloth-making industry chiefly to this district.

Fall River and Lowell (*see map, page 143*) make more cotton cloth than any other two cities in America. New York and Boston handle much of the raw cotton used in the great cloth-making states. Many cotton mills are now running in the cities of the South, and the outlook is very bright for a thriving industry there.

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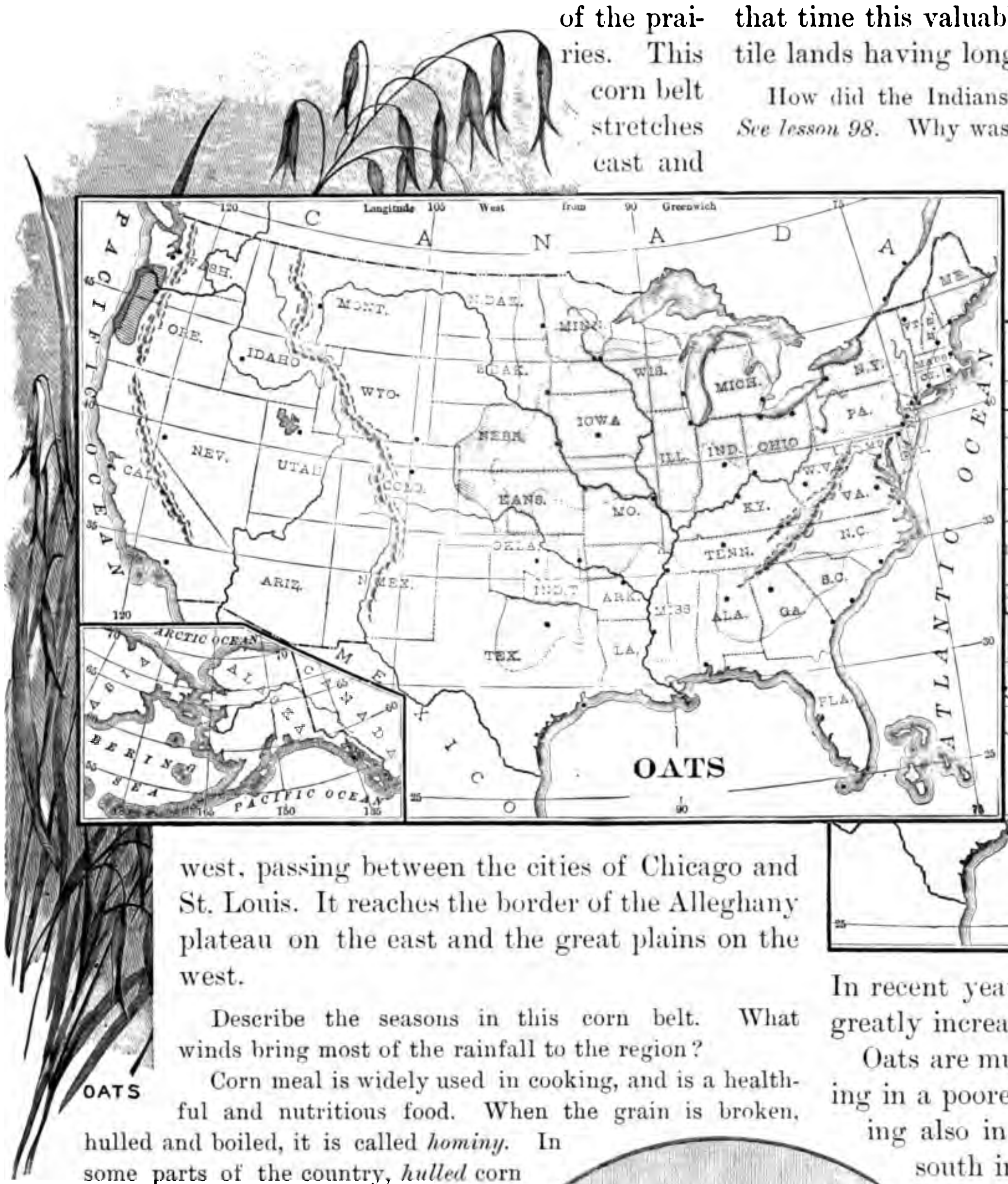
[1] The reddish tint on the above *Cotton* map outlines the district known as the *cotton belt* of the United States. The darker the tint, the larger the yield.

gulf of Mexico, and in the extreme north where early frosts are common or where there are dense forests. The best region for the growth of corn is in the southern half of the prairies. This corn belt stretches east and west, passing between the cities of Chicago and St. Louis. It reaches the border of the Alleghany plateau on the east and the great plains on the west.



Describe the seasons in this corn belt. What winds bring most of the rainfall to the region?

Corn meal is widely used in cooking, and is a healthful and nutritious food. When the grain is broken, hulled and boiled, it is called *hominy*. In some parts of the country, *hulled* corn and milk form a favorite dish. *Green corn*, or *sweet corn*, is often boiled on the cob and is thus used for food. A large amount of sweet corn is canned for market.

Great quantities of corn are used to fatten live stock, especially hogs and cattle. There is more live stock in the corn belt than in any other part of the United States.

Corn Harvest in the Azores.

Chicago and the other large lake and river ports serve as centers for the collection and distribution of corn. New York and the other great eastern seaports carry on a large foreign trade in this grain.

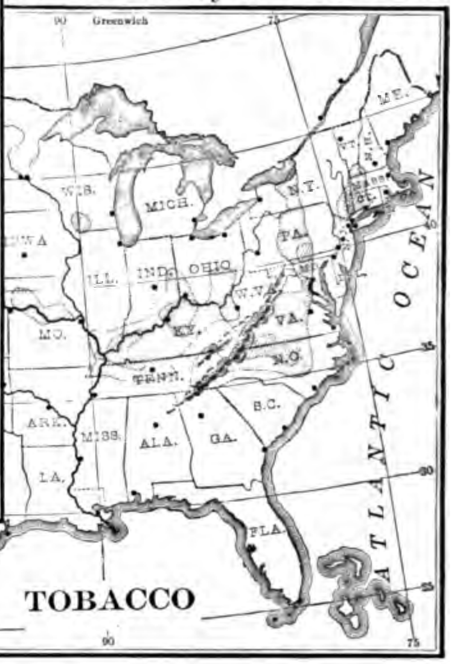
The United States supplies the larger part of the corn of commerce. This grain is sent chiefly to the British Isles and Germany, to help feed the millions of people in the workshops of those countries.

When the early white settlers came to America, they found here a new kind of grain raised by the Indians. The white men gave it the name of *Indian corn.* Since that time this valuable grain has spread to nearly all fertile lands having long and hot summer weather.

How did the Indians prepare the forest lands for cornfields? *See lesson 98.* Why was it necessary to kill the trees?

### 132. Oats, Barley and Rye.

Oats are not native to America and have not been so widely sown in our country as corn or wheat.



In recent years, however, the crops of oats have greatly increased and are now very valuable.

Oats are much hardier than corn, — often growing in a poorer soil and a colder climate, but thriving also in the fertile prairies and still farther south in the coastal plains.

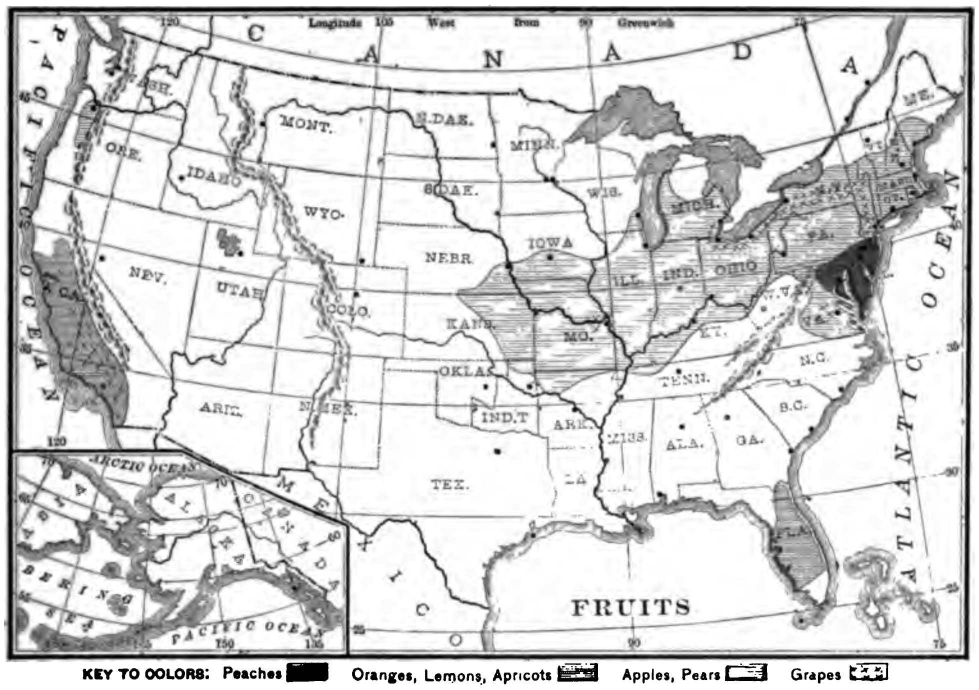
In the United States, as well as in other parts of the world, the oat crops are largest in about the same districts that produce the most wheat and corn. Nearly all the oats exported from our country are sent to England.

Barley and rye are hardy grains, but they do not take a leading place among the cereal crops of the United States. Rye is an important food-product in Russia, Germany and other parts of Europe.

### 133. Tobacco.

The tobacco of commerce consists of the dried, or *cured*, leaves of several species of plants. Some of these grow to the height of six feet or more and bear large coarse leaves, on their simple upright stalks.

The Appalachian highland is forested with both soft-wood and hard-wood trees. Forests of hard-wood trees abound in the states of the Ohio basin.



KEY TO COLORS: Peaches ▇ Oranges, Lemons, Apricots ▤ Apples, Pears ▭ Grapes ▦

The hard-wood forests in the states which border on the Great Lakes have given this region the lead in the manufacture of agricultural implements, carriages and wagons. Great forests cover a large portion of the Atlantic and Gulf coastal plains and extend far into Texas.

What have you read about the forest products of the Atlantic coastal plain? *See lesson 54.* What valuable forest trees grow on the Gulf coastal plain? *See lesson 53.*

What kinds of lumber are sawed in the mills around Puget sound? *See lesson 36.* Where is redwood found?

The United States produces more lumber, and manufactures more woodenware, than any other country in the world does.

### 135. Fruits.

The United States is bountifully supplied with fruits. Some of them are wide-spread, but others are confined to small areas. The most important peach area in this country extends along the coastal plain from the Potomac river to the mouth of the Hudson river.

This peach district is near the northern end of the Atlantic coastal plain. There the canning, packing and shipping of fruit form a very important industry. What state lies wholly within this peach area? What other states are partly within it?

There are several well-known apple areas. One extends the entire length of the Ohio valley and for quite a distance up the Missouri valley. The districts east of Lake Michigan and southeast of Lake Erie are famous for this fruit. It abounds also in all the states eastward to Maine. Pears have about the same range as apples.

Large quantities of grapes grow along the southern shore of Lake Erie and in the Mohawk valley. This fruit is sold mostly in boxes to the people in the great eastern cities. The grapes of California are marketed largely in the form of raisins, but great quantities of the grapes are pressed for their juice which is made into wine.

Raisins are sun-dried grapes. The curing of the fruit requires very hot and dry weather. A few days of rain in the curing season may spoil a year's crop. California is noted both for its raisins and its grape wines.

Southern California and Florida have many orange and lemon groves. These districts supply the best oranges found in our markets.

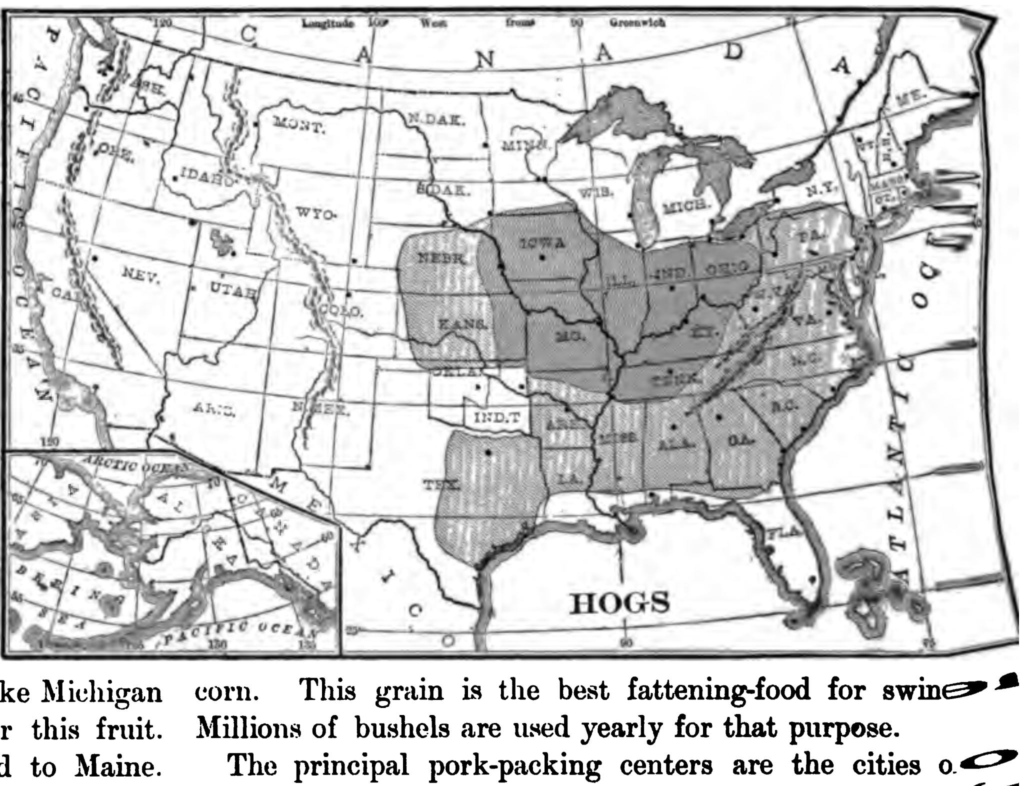
Most of the lemons and oranges imported into the United States come from Italy. The West Indies and Central America supply bananas.

### 136. Horses, Mules and Hogs.

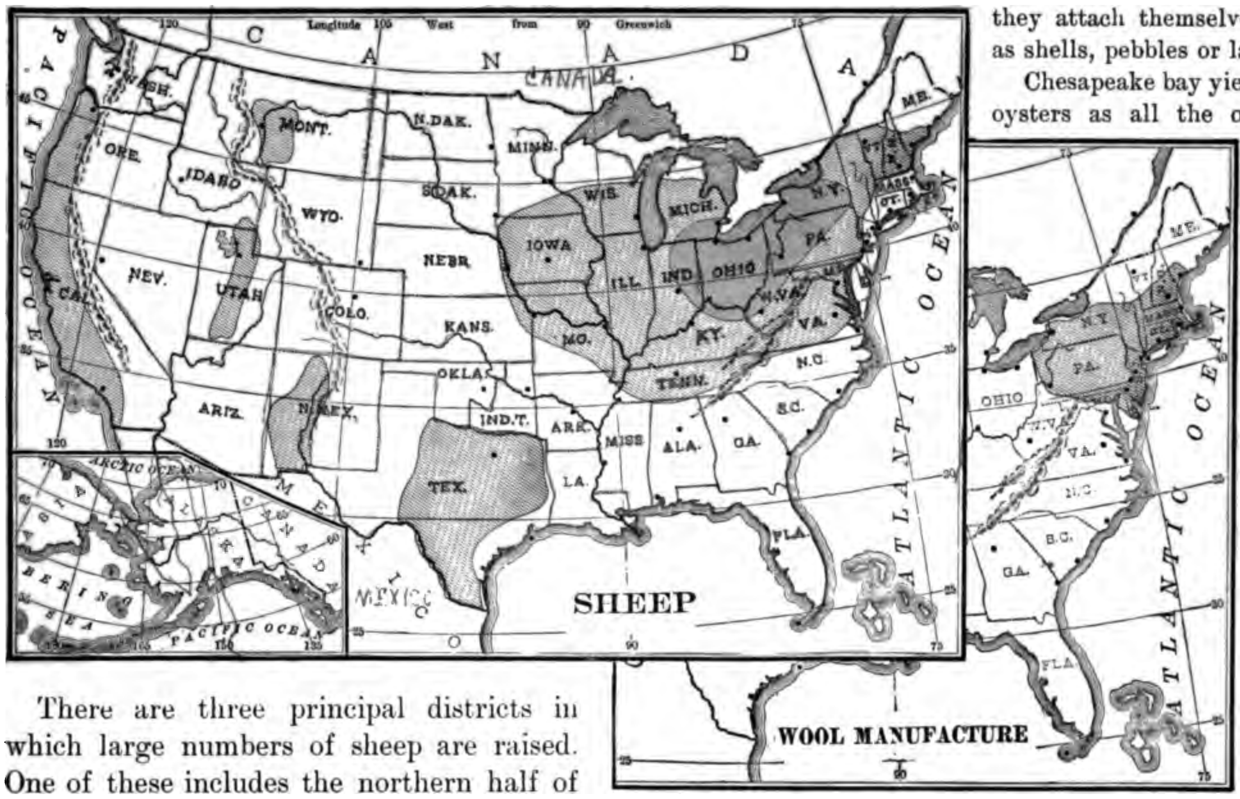
*Horses and Mules.* Horses were first brought to America by Spanish explorers. These useful animals are now raised in nearly all grassy portions of the New World. Mules also are common in most parts of America, but chiefly in the warmer regions.

Horses and mules are raised in greatest numbers in the most fertile districts, where there is work for them on the farms. There are about one third as many horses as cattle in our country.

*Hogs.* Many hogs are raised in every state in the Union, but chiefly in the districts which produce the most corn. This grain is the best fattening-food for swine. Millions of bushels are used yearly for that purpose.



The principal pork-packing centers are the cities of the prairies, especially Chicago and Kansas City (Kansas)



There are three principal districts in which large numbers of sheep are raised. One of these includes the northern half of the Alleghany plateau and extends westward over the prairies; another is in Texas; the third lies west of the Sierra Nevada.

In our country most of the woolen mills, as well as the cotton mills, are in New England, New York and Pennsylvania.

Boston is a great wool market, because it distributes this fiber to the mills of New England. In the manufacture of woolen carpets, Philadelphia ranks first in the world.

In the production of wool the leading regions of the world are eastern Australia and New Zealand; the La Plata basin; Great Britain; the steppes of Russia; and the United States.

Our country must import wool and sheepskins, because it uses more than it produces; but the other regions export these products, — chiefly to Great Britain, France and Germany.

### 139. Fisheries.

*Oysters.* Oysters are salt-water shellfish and are the most valuable food product taken from the shore waters of the United States. The most extensive oyster fisheries in the world are carried on in Chesapeake bay. Several thousand boats and many thousand men are there employed. Smaller oyster beds are found along several other parts of the coast of our country.

Baltimore is the center of the oyster trade.

The oyster fisheries are scattered along the coast from Cape Cod to Mexico, — wherever the sea-bottom is firm. Young oysters die unless they attach themselves to hard substances, such as shells, pebbles or larger stones.

Chesapeake bay yields about four times as many oysters as all the other places on our coasts. Many of the oysters are gathered by means of tongs having long handles. In some places, dredges are dragged over the bottom to gather the shellfish.

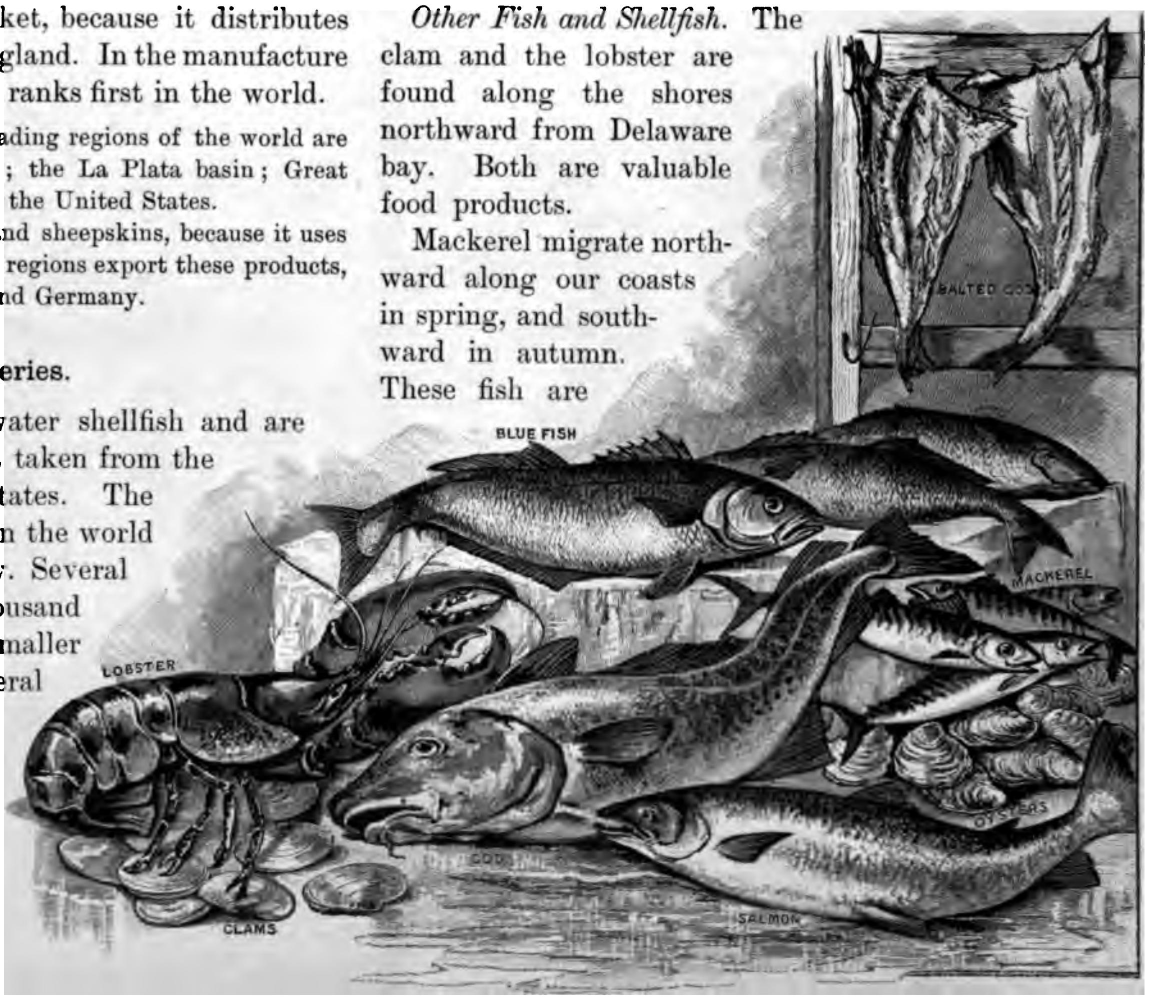
In the oyster fisheries, France ranks next to the United States. Great Britain also has extensive oyster beds.

*Cod and Haddock.* The cod fisheries rank next in importance to the oyster fisheries. The codfish, and also the haddock and the halibut, are caught mostly on *banks*, or shoal places in the sea.

Off the coast of North America, the best fishing grounds for cod and haddock are the *banks of Newfoundland*, and *Georges banks* northeast of Cape Cod. The halibut is found in about the same places as the codfish. The former is the largest of flatfish and sometimes weighs a hundred pounds.

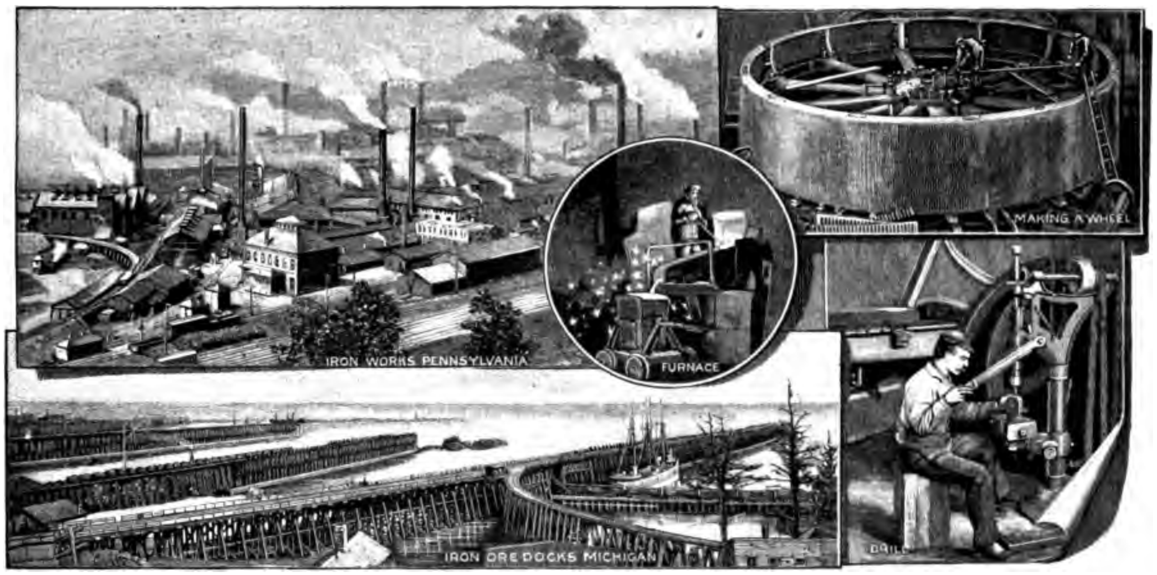
*Other Fish and Shellfish.* The clam and the lobster are found along the shores northward from Delaware bay. Both are valuable food products.

Mackerel migrate northward along our coasts in spring, and southward in autumn. These fish are



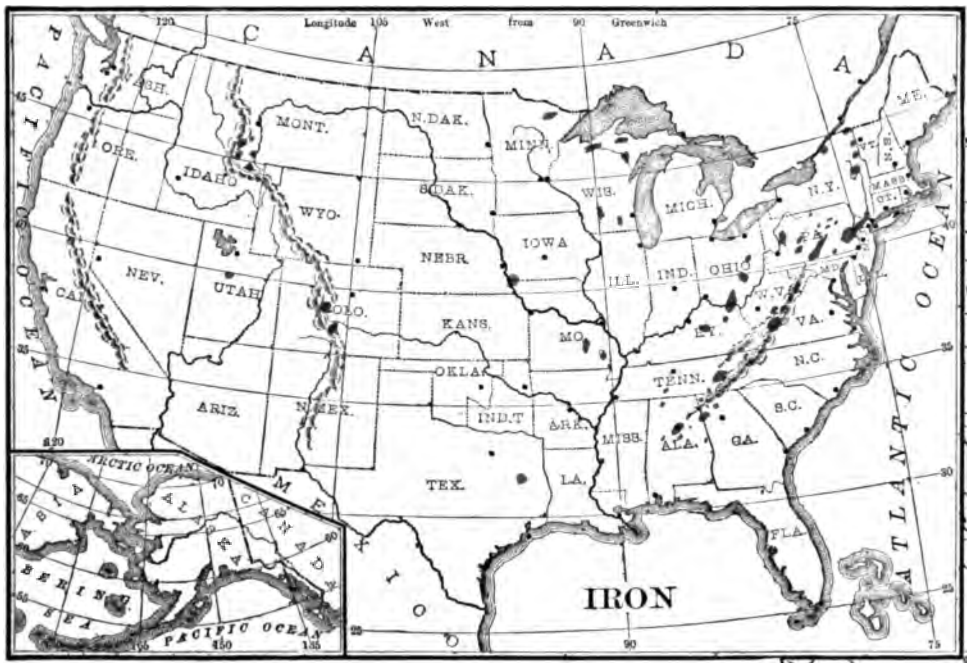
Pennsylvania, at the northern end of the Appalachian coal field, supplies more than one half the coal used in the United States. Illinois ranks second, and Ohio third.

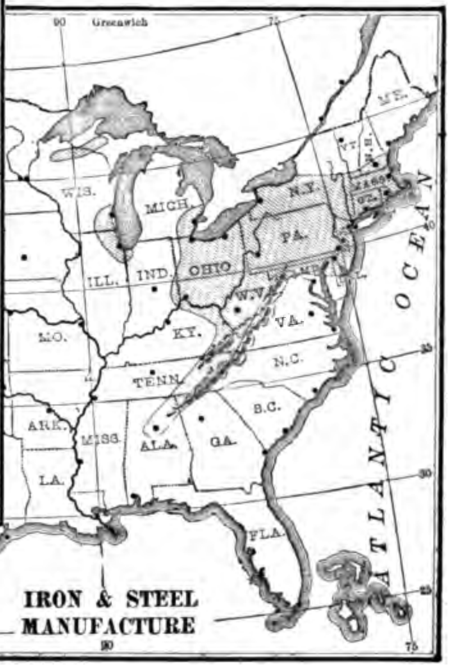
Pennsylvania furnishes nearly all the *anthracite* coal mined in the country, as well as a large part of the soft, or *bituminous*, coal. The hard coal is found near the northern end of the Alleghany ridges. The coal of the Illinois field aided greatly in the settlement of the prairies where wood was scarce.



Large quantities of soft coal are put into ovens that shut out most of the air. These are heated till certain gases are driven off or burned. By this process the coal is changed to *coke*, which is better than soft coal for heating purposes.

*Charcoal* is made by burning or charring wood to which very little air has access. Charcoal resembles true coal, but the former is much the lighter and the more porous.





All the large cities in or near the coal fields are important markets for coal. Among the cities having the largest trade in this product are Philadelphia, Pittsburg and Chicago.

Great Britain, Germany, Austria, France and Belgium have extensive coal beds and iron mines, and have therefore taken a leading place among the manufacturing countries of the world.

### 141. Iron.

There are four principal iron ore districts in the United States. These are all in old worn-down mountain regions. The most productive district is near the shores of Lake Superior. The other districts are the Alleghany ridges in Pennsylvania; the Adirondack mountains in New York; and the southern part of the Appalachian highland in Alabama.

The process of extracting iron from its ore is called *smelting*. The usual mode of smelting is as follows: The ore and coal, with some limestone, are placed in a tall furnace, and the coal is then set on fire.[1] A hot blast of air is forced through the burning mass to strengthen the fire. As the iron of the ore melts, the heavy liquid settles to the bottom of the furnace and is drawn off, while the impure matter, or *slag*, floats on the surface.

The furnace through which the blast of air is driven is known as a *blast furnace*. The molten iron is usually run into molds where it cools in short bars weighing about one hundred pounds each. In this form the metal is called *pig iron*, and is ready for shipment to the foundries where it may be cast into the form of stoves, hydrants, posts and scores of other objects.

Iron that is to be used for certain purposes is put through a series of heating processes which change it into steel. This is used in making rails, engines, steamships, cutlery, tools and other articles that must withstand a great deal of wear and strain, or that must take keen edges.

The iron ore of the Lake Superior district is plentiful and pure. It is therefore so valuable that it competes

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[1] In Pittsburg and some other cities, natural gas is used for fuel. Limestone mixed with the iron ore causes it to *fuse*, or melt, more quickly.

**The petroleum exported each year from the United States is of greater value than the gold mined here in the same time. Great Britain, France, Germany, Japan and India are among the best customers for American oil.**

In the oil fields, and extending somewhat beyond their limits, is found *natural gas*. This gas, like the petroleum, is obtained by sinking pipes in the ground.

**Natural gas in the ground is not stored in caves or other great cavities, but in porous rock, such as sandstone or limestone. Layers of shale, or clay rock, over the porous rock prevent the gas from escaping.**

The most valuable gas wells in the United States are in Pennsylvania, Indiana and Ohio. In these states, the low cost of natural gas has in recent years caused very rapid growth in manufactures.

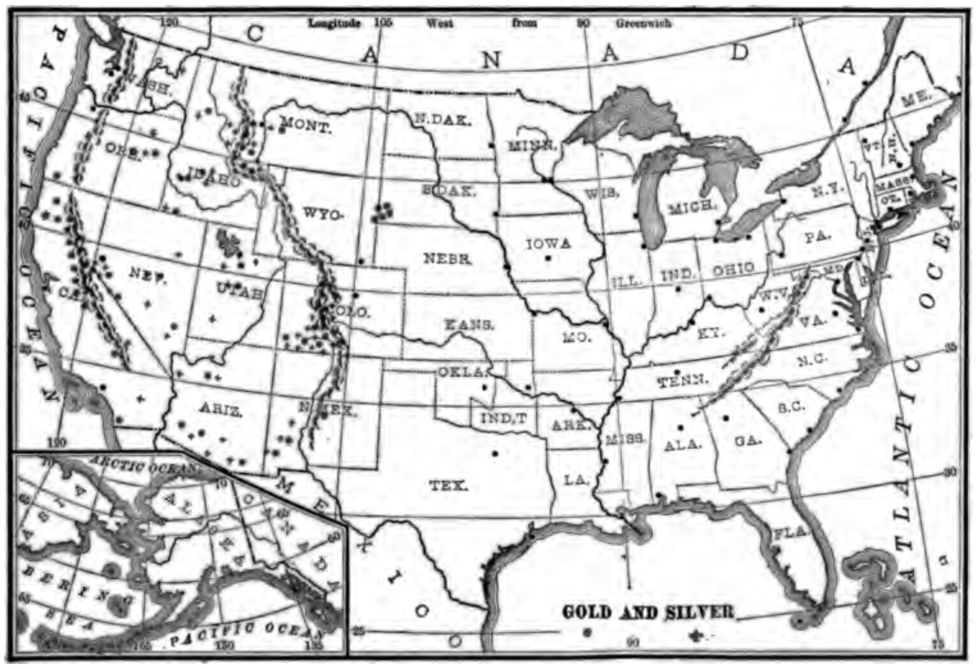
**Natural gas is used chiefly for heating purposes. The gas can be regulated to give strong and steady heat, and this fuel is therefore of great value in iron mills and glass works. It is also used as fuel in dwellings near the gas regions.**

**Many of the wells which once gave out gas under great pressure have now run out. Others are fast becoming weak. Still others have been flowing for years.**

**Natural gas and petroleum doubtless have a common origin in the decay of plants and animals in ancient rock layers.**

### 143. Gold and Silver.

Gold and silver are called *precious metals*, but they are not nearly so useful as iron. The value of the precious metals is largely due to their scarcity.



**Which of the coins of the United States are made of gold? Which are made of silver? Name some other uses of gold and of silver.**

**What have you learned about the gold-bearing gravels of California?** ***See lesson 35.***

Gold is found pure in nature. It is most often taken from veins of quartz rock or from old river gravels formed largely of the washings of quartz veins.

**Smeltery.**

**Hydraulic Mining.**

**Gold is separated from quartz by crushing the rock and then mixing the mass with quicksilver and water. The gold and quicksilver soon unite with each other. The** ***amalgam,*** **or compound of the two metals, is heated and the quicksilver is thus driven off, leaving the gold. One of the pictures on this page shows a** ***smeltery*** **where work of this kind is done.**

**Another picture shows how a stream of water may be used to wear down gold-bearing gravel beds. Such work is known as** ***hydraulic mining.*** **The gravel, and the gold which it contains, are washed into a long trough, as described in lesson 35.**

The richest gold fields in the world are the western highland in our country; the mountains of southeast Australia; South Africa; and Siberia. The gold mines of South Africa are being very rapidly developed.

**California leads the other American states in the quantity of gold mined. Colorado, Montana, Nevada and South Dakota also take high rank in the production of this precious metal.**

Silver is rarely found in a pure state, but is almost always combined with other mineral substances.

America supplies most of the silver used in the world. Until recent years, the chief sources of silver ore were Mexico and the middle Andes, — in Peru, Bolivia and Chile. These countries still yield large amounts of the metal.

**Colorado, Montana and the states in the Great Basin take the highest rank in the production of silver ore. About two thirds of the ore mined in our country are taken from the Rocky mountains of Colorado and Montana.**

In prosperous mining years the output of gold and silver in the United States amounts to about $100,000,000, — equal to the cost of the Suez canal. This amount, however, is far less than the value of either the corn, the wheat or the cotton raised in our country. The value of the silver is about

### 146. Review and Map Studies.[1]

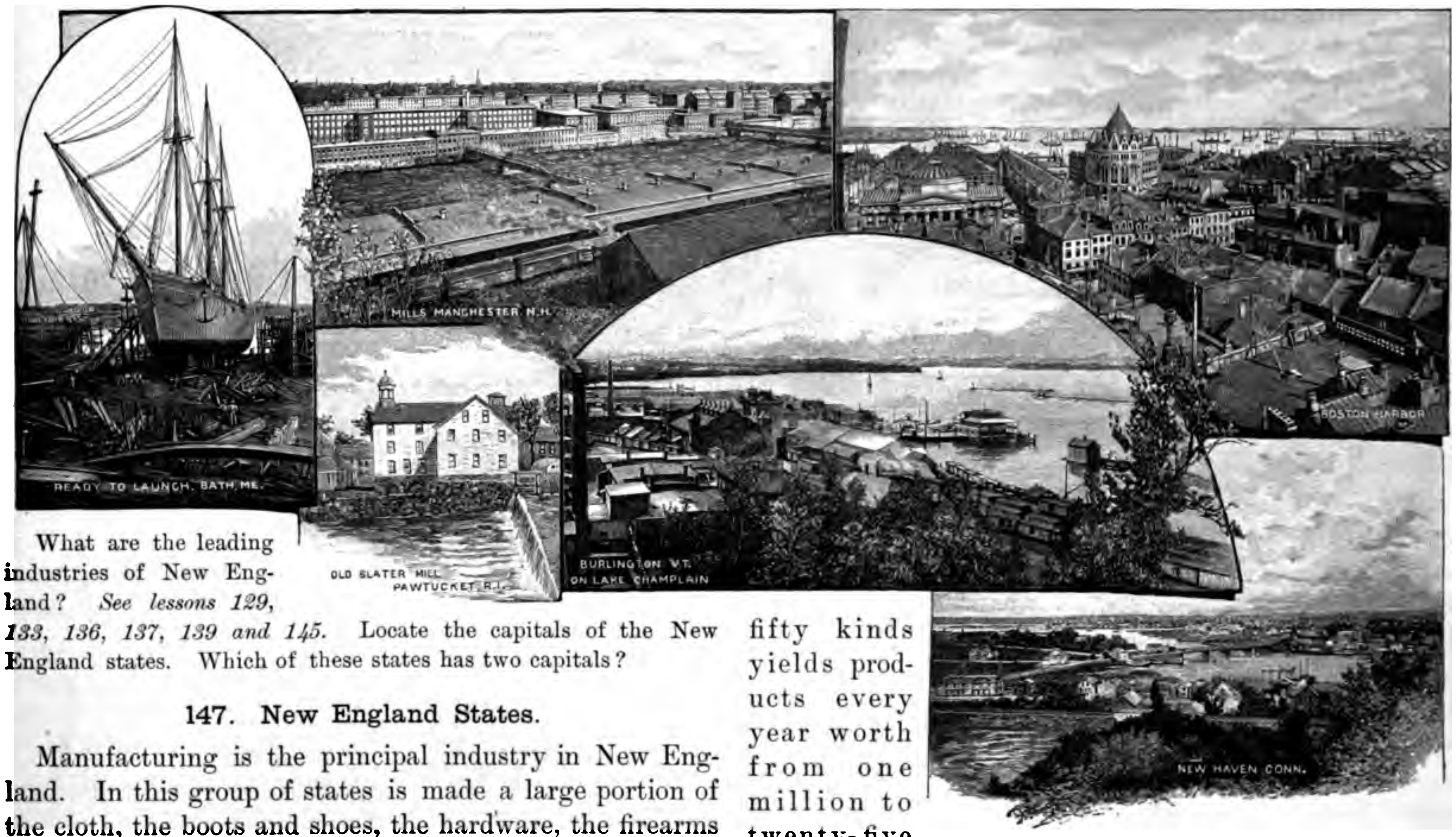
What does the corner map of the United States on the opposite page show about New England, — its position, size, etc.? Which is farther north, — Boston or Rome? — Boston or Portland (Oregon)?

What have you learned about the surface of New England? *See lesson 45.* Why are there so many lakes and falls in this region? Which of the New England states is partly in the Great Valley? *See page 46.* Where is Lake Champlain?

Locate Cape Cod peninsula; Marthas Vineyard and Nantucket; Penobscot bay; Long Island sound. Why is the seacoast so irregular? *See lesson 45.*

Describe the course of the Connecticut river. Where is the Merrimac river? — The Blackstone river?

What do the maps on pages 21, 24, 128 and 129 show about the climate of New England? Why is its climate more severe than that of the coast of Europe in the same latitude?


MILLS MANCHESTER N.H.
READY TO LAUNCH, BATH ME.
OLD SLATER MILL PAWTUCKET R.I.
BURLINGTON VT. ON LAKE CHAMPLAIN
BOSTON HARBOR
NEW HAVEN CONN.

What are the leading industries of New England? *See lessons 129, 133, 136, 137, 139 and 145.* Locate the capitals of the New England states. Which of these states has two capitals?

### 147. New England States.

Manufacturing is the principal industry in New England. In this group of states is made a large portion of the cloth, the boots and shoes, the hardware, the firearms and other goods of various kinds used in our country.

With excellent water power, deep harbors, soft-wood forests, and quarries of building stone, New England has grown rich and prosperous. No people in the world have done more for public schools and libraries than the people of New England.

MASSACHUSETTS. **Boston,** the chief trade center of New England, now has a population of more than half a million, — about one tenth of the people in this group of states. Boston owes its growth largely to the fact that here the railroads from the west reach the chief harbor on the New England coast. Among American cities, Boston ranks second in foreign commerce. It has also a large domestic commerce.

The mills and factories of New England use great quantities of cotton, wool, leather and rubber. Part of this material comes through the port of Boston.

This city distributes cloth and leather goods made in the mills and factories of this section. Shiploads of western products — such as pork, cattle and beef — are sent from this port to Europe.

Boston has excellent railroad connections with all parts of the country. The *Boston and Maine* lines spread northward; the *New York, New Haven and Hartford* railroad forms a network to New York; the *Boston and Albany,* and other lines, afford direct routes westward.

Boston, like all other great cities in our country, has extensive manufactures.[2] Among these, each of nearly fifty kinds yields products every year worth from one million to twenty-five million dollars. The most valuable manufacture is clothing.

There is a United States navy yard on Boston harbor.

Among the cities of this state, **Worcester** ranks second in size. It is a railroad center and has a great variety of manufactures.

We have learned that **Fall River** and **Lowell** manufacture more cotton cloth than any other two cities in America. It would take three fourths of all the gold mined yearly in our country to pay for the cotton goods made in Fall River alone. **Lawrence,** a little below Lowell on the Merrimac, takes high rank in both woolen and cotton goods.

**Cambridge** is the seat of Harvard University.

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[1] Do not forget to locate every place named in the text.

[2] The largest cities of the United States, in the order of size, are: New York, Chicago, Philadelphia, Brooklyn, St. Louis and Boston. These cities rank in the same order in the value of their manufactures.

**Pawtucket** and **Woonsocket,** on the Blackstone river, have large cotton mills. In the old Slater mill of Pawtucket, cotton manufacturing in this country was first started in 1790. *See picture on page 143.*

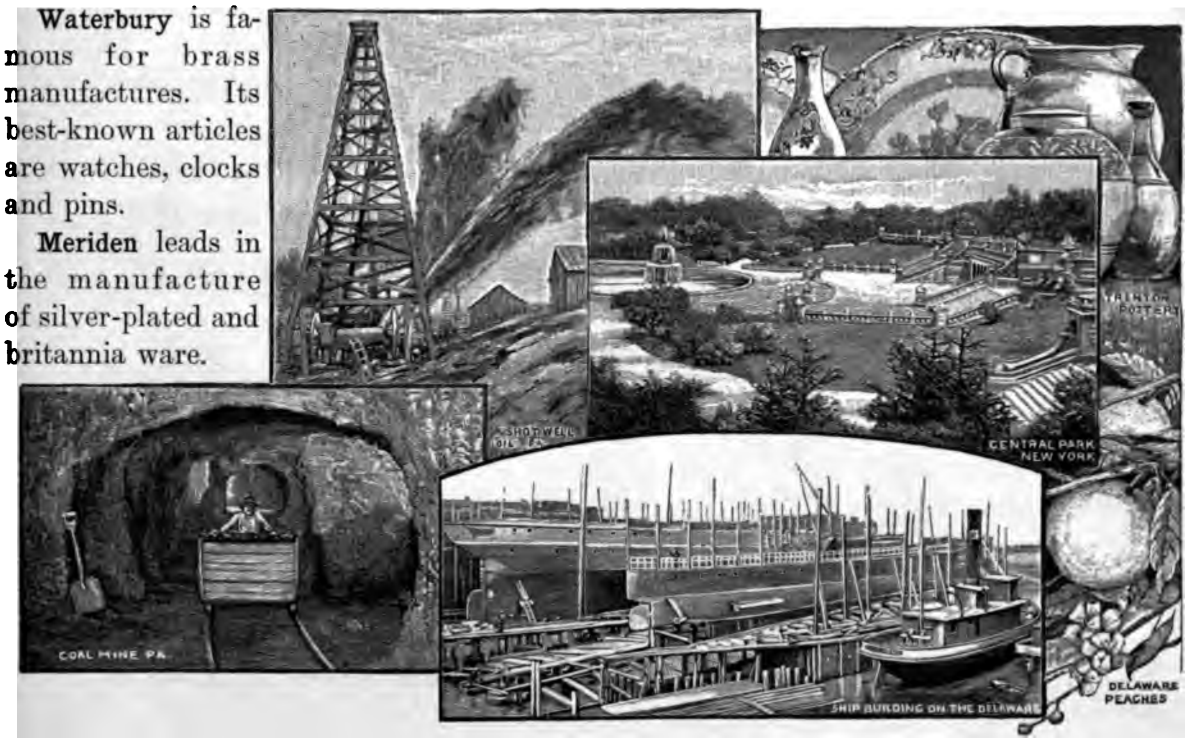
Rhode Island is the only state now having two capitals. **Newport,** one of the capitals, is a famous summer resort.

CONNECTICUT. **New Haven** is the largest railroad center and port in Connecticut, and is the seat of Yale University. This city manufactures hardware and firearms.

**Hartford,** the capital, is at the head of steamboat navigation on the Connecticut river. **Bridgeport** is a manufacturing city on Long Island sound.

**Waterbury** is famous for brass manufactures. Its best-known articles are watches, clocks and pins.

**Meriden** leads in the manufacture of silver-plated and britannia ware.



## 148. Review and Map Studies.

Which is larger, — Maine or New York? Which is farther north, — New York or Chicago? — Richmond or San Francisco?

Refer to the maps on pages 21, 24, 128 and 129, and tell what you can about the climate of these states.

Which states of this group are partly in the Atlantic coastal plain? What are some of the products of the piedmont and the coastal plain in these states? *See lessons 45, 54, 134, 135 and 139.*

Describe the Old Appalachian range in this group of states. *See lesson 45.* Describe the Great Valley. *See lesson 46.* What two branches of the Great Valley lead into the Hudson gorge?

What useful products are taken from the Alleghany ridges and plateau in this group of states? *See lessons 47 and 140.* What two rivers unite at Pittsburg to form the Ohio river?

Describe the main slopes of the land in this group of states. Of what state is Long Island a part? Locate the capitals of the Middle Atlantic states.

## 149. Middle Atlantic States.

The slight drowning of ancient coastal valleys has made fine harbors for New York, Brooklyn, Philadelphia and Baltimore, — four of the commercial cities of the Union. The Hudson and Mohawk valleys turn much of the western export trade to New York. Several railroad lines from east to west have been built across the Appalachian highland. This highland is rich in coal, iron ore, petroleum and natural gas. The piedmont belt yields immense crops of tobacco. The coastal plain is a leading fruit district. Chesapeake bay has valuable oyster beds.

With all these advantages, this group of states has grown wealthy, and three of its cities are among the largest four in America. New York ranks first, Philadelphia third, Brooklyn fourth, — Chicago being second.

NEW YORK. **New York** has more than three times as large a population as Boston. In amount of foreign trade, London alone surpasses the *port* of New York. The great seaport at the mouth of the Hudson river carries on more than half the foreign trade of our country.

The *port* of New York is connected with the interior by several trunk lines of railroad. Among these are the *New York Central* and the *Pennsylvania* systems. The former extends along the Hudson and Mohawk valleys, reaching Buffalo on Lake Erie. At Albany this line connects with the *Boston and Albany* railroad. The *Pennsylvania* line runs to Philadelphia, and thence to Pittsburg.

The chief exports from New York are meats, cotton, petroleum, wheat and flour. Most of these are sent to Great Britain and other countries of western Europe.

New York's principal imports are — cloth from England, Germany and France; coffee from Brazil and other parts of tropical America; cane sugar from the West Indies, and beet sugar from Germany; tin plate from England; rubber from Pará; tea from China and Japan.

New York is the greatest manufacturing center in America. The total value of the manufactures of this city is greater than that of all the articles of import into our country.

The great value and variety of the articles made in this city may be judged from the fact that there are more than one hundred industries, each of which yields products worth from $1,000,000 to nearly $150,000,000 each year. The most important manufactures are various articles of clothing, books, cigars, leather goods and furniture.

New York, Brooklyn and Jersey City prepare great quantities of meat for market.

**Brooklyn** is a little more than half as large as New York. These two cities are joined by the largest suspension bridge in the world.

**Pittsburg's** leading industry is the manufacture of iron and steel goods. Among these are locomotives, steel rails, car wheels, and armor plate for ships of war.

Excellent sand for glass-making is found in the upper Ohio valley, and Pittsburg is famous for glassware.

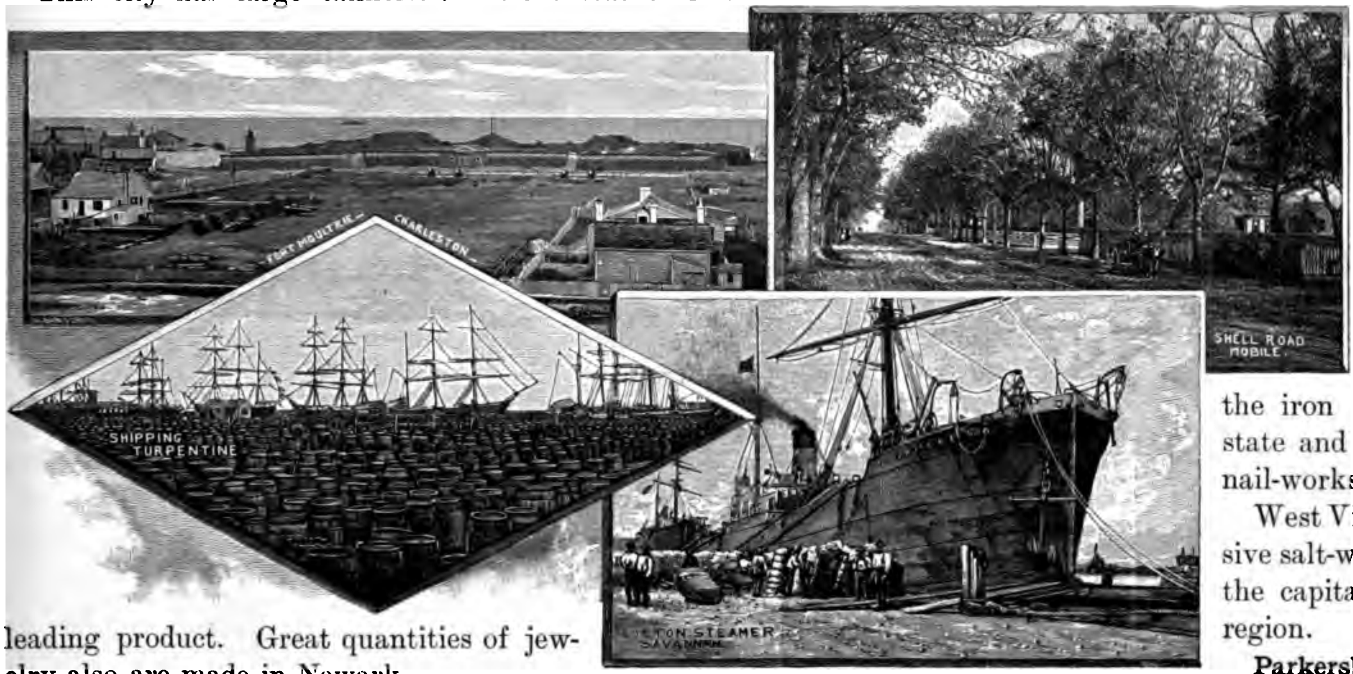
This city has a large trade in soft coal and in petroleum.

**Allegheny** lies across the river from Pittsburg. These cities resemble each other in their trade and manufactures, but Pittsburg is much the larger.

**Scranton, Reading** and **Erie** have large iron works.

NEW JERSEY. **Newark,** the largest city in New Jersey, is on the line where the piedmont belt adjoins the lower coastal plain.

This city has large tanneries. Patent leather is a leading product. Great quantities of jewelry also are made in Newark.



**Jersey City** forms an important part of the *port* of New York. Many ocean steamers clear from the Jersey City side of the harbor, because they can there meet the freighted trains from several railroad lines that do not enter the city of New York.

**Paterson** has the largest silk factories in the United States. **Camden,** opposite Philadelphia, is one of the cities having shipyards on the Delaware.

**Trenton,** the capital, is famous for its fine pottery.

DELAWARE. **Wilmington** contains more than one third the population of the state. The chief manufactures of the city are leather and cars.

The canning and packing of fruit form the leading industry of **Dover,** the capital of Delaware.

MARYLAND. **Baltimore** is on a fine harbor not far from the head of Chesapeake bay. The foreign commerce of this city is about equal to that of Philadelphia.

Baltimore is almost surrounded by fruit districts. It is not far from the piedmont tobacco regions of Virginia and Pennsylvania. The long grain belt from Lake Ontario to Chesapeake bay includes the country around Baltimore. This bay supplies more oysters than are taken from any other equal area in the world.

With these natural advantages, Baltimore takes high rank in the canning and shipping of fruit and oysters, and in the manufacture of tobacco articles and flour.

The United States Naval Academy is located at **Annapolis** in this state.

VIRGINIA. **Richmond** ranks next to New York and St. Louis in the manufacture of tobacco articles. Richmond is also a leading market for leaf tobacco.

This city is at the head of tide water on the James river, and has an active coasting trade.

**Norfolk,** the chief port of Virginia, ships great quantities of cotton. There is a large United States navy yard on the harbor, opposite Norfolk.

**Petersburg** and **Lynchburg** are important tobacco markets.

WEST VIRGINIA. **Wheeling** is the center of the iron industry of the state and is noted for its nail-works.

West Virginia has extensive salt-works. **Charleston,** the capital, is in the salt region.

**Parkersburg** has a large trade in both crude and refined petroleum.

### 150. Review and Map Studies.

If a ship were to sail due west from the strait of Gibraltar, what part of our coast would it reach? Describe the climate of this section. *See maps on pages 21, 24, 128 and 129.*

Which of the states of this group lie partly within the Atlantic coastal plain? Name two valuable products raised near the coast. *See lesson 54.* What are the leading products of the coastal plain and of the piedmont belt farther inland? *See lessons 53 and 54.*

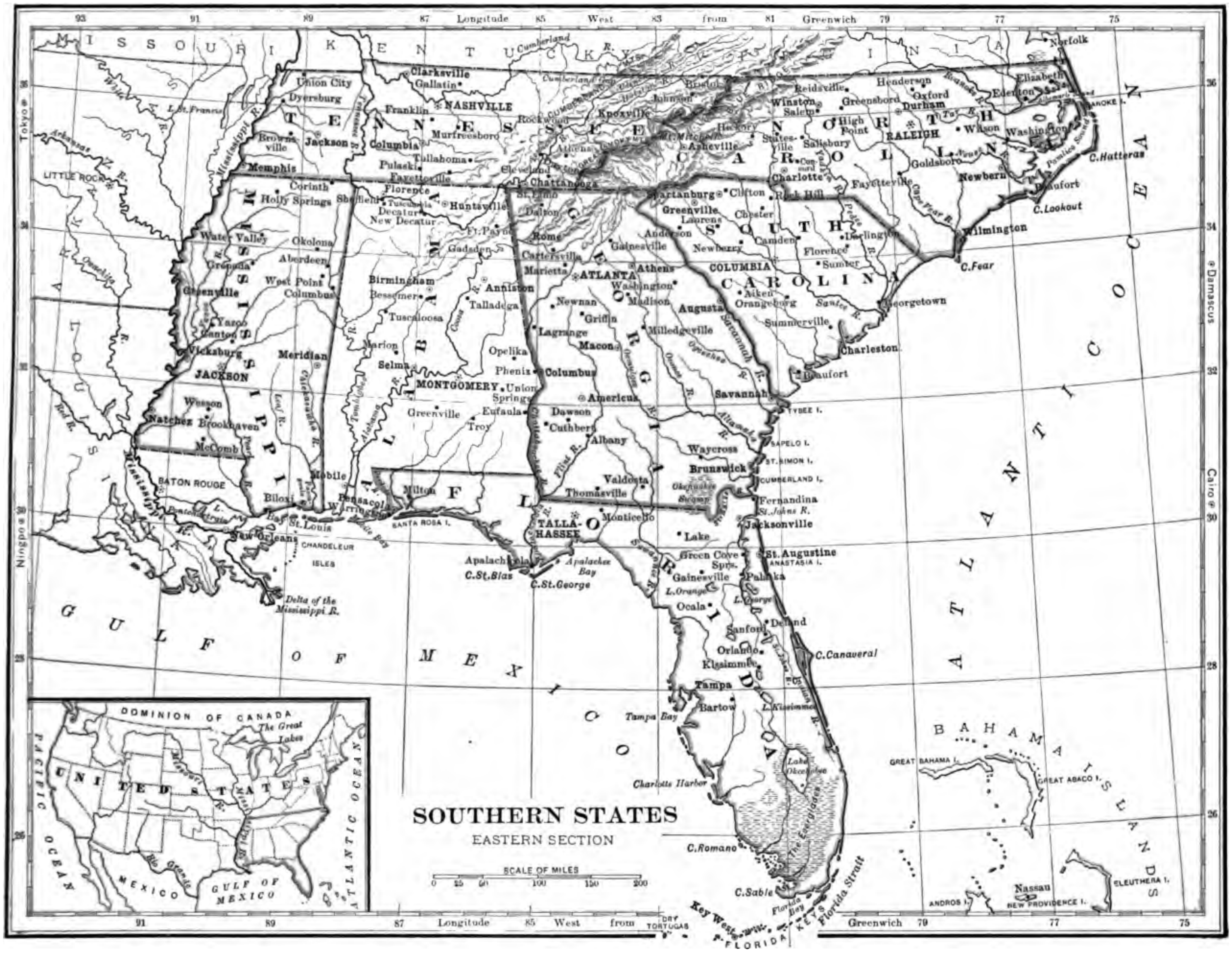
What have you learned about the Carolina highland? *See lesson 45.* Why is the northern half of the Alleghany plateau more thickly settled than the southern half? *See lesson 47.*

Locate the state capitals in this group.

### 151. Southern States, — Eastern Section.

The region at the southern end of the Appalachian highland has rich mines of iron ore and of coal. The uplands of this section form one of the most productive cotton districts in the world. Corn and tobacco also abound. Many falls and rapids at the lower border of the piedmont in these states have in recent years led to the building of extensive cotton mills.

Great areas of the coastal plain are covered with forests of yellow pine which yield valuable lumber, rosin and turpentine. Among the lesser products of this section are early fruits and vegetables. The swampy coastal lowlands produce great quantities of rice.



North Carolina. **Wilmington** has a good harbor on the tidal waters of the Cape Fear river. The chief exports are cotton and tobacco from the uplands; and lumber, rosin and turpentine from the yellow-pine forests of the coastal plain.

**Raleigh,** the capital, is in the cotton and tobacco district. This city is the leading cotton market in the state, and is well known for its tobacco manufactures.

**Charlotte** is an important railroad center, and therefore a market for the products of the surrounding district.

**Asheville** is a beautiful mountain resort.

South Carolina. **Charleston** is the chief seaport of South Carolina. This city and Wilmington export more rosin and turpentine than any other two ports in the world. Charleston takes high rank in the export of cotton and rice.

Near Charleston, and in the river bottoms and marshy lands farther south, is found a kind of rock known as *phosphate rock.* Large quantities of it are prepared for use as a fertilizer.

**Columbia,** the capital, is the railroad center of the state.

Georgia. **Atlanta** is situated where several railroads from the Atlantic coastal plain meet others from the Mississippi valley. This city is therefore a trade center for nearly all kinds of southern products. Atlanta has extensive cotton mills.

**Savannah** and Charleston resemble each other in their exports. Only New Orleans and New York, among the seaports of our country, surpass Savannah in the export of cotton. This city has a large trade in rice.

**Augusta, Macon** and **Columbus** are not only important markets for southern products, but they also have good water power for their cotton mills. Augusta has the largest cotton mills in the South.

FLORIDA. **Key West,** the largest city in Florida, is on a coral island. The chief manufacture in this city is cigars made of Cuban tobacco. Sponges, gathered from the surrounding waters, are shipped from this port.

Key West is a United States naval station.

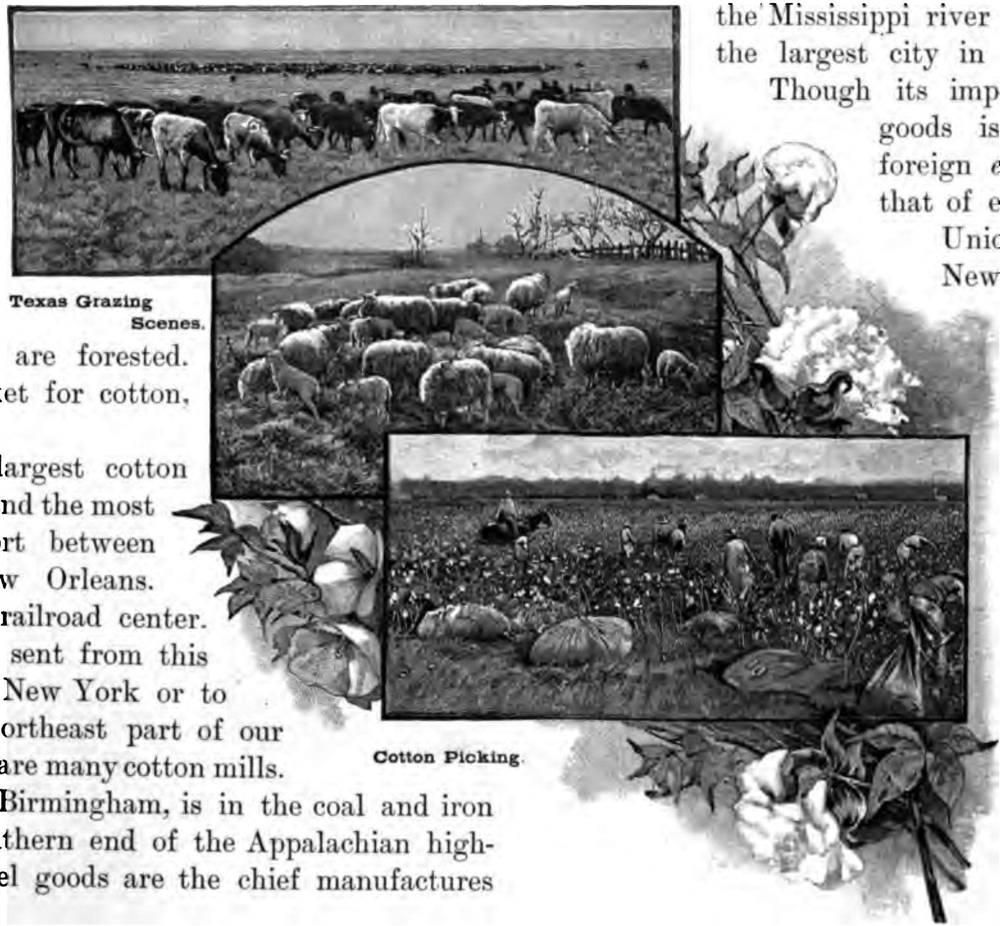
**Jacksonville** has a large trade in lumber and oranges.

**Pensacola** exports great quantities of lumber. A United States navy yard is located near this port.

ALABAMA. **Mobile,** at the head of Mobile bay, is the principal port, and forms the outlet for a large portion of the cotton and the lumber products of the state.

**Birmingham** is situated in the coal and iron district near the southern end of the Appalachian highland. This city has extensive manufactures of iron and steel.

**Montgomery,** the capital, has a large trade in cotton.



Texas Grazing Scenes.

Cotton Picking.

MISSISSIPPI. **Vicksburg, Meridian** and **Natchez** are important cotton markets.

TENNESSEE. **Nashville,** the capital, is in the belt where the cotton and the tobacco districts merge into each other. Large areas in Tennessee are forested. Nashville is a market for cotton, lumber and tobacco.

**Memphis** is the largest cotton market in the state, and the most important river port between St. Louis and New Orleans. Memphis is also a railroad center. Much of the cotton sent from this city goes by rail to New York or to other cities in the northeast part of our country, where there are many cotton mills.

**Chattanooga,** like Birmingham, is in the coal and iron district near the southern end of the Appalachian highland. Iron and steel goods are the chief manufactures in both these cities.

**Knoxville** is the trade center of northeastern Tennessee.

### 152. Review and Map Studies.

What two territories are in this group? Which is the larger, — Texas or New England? Which reaches farther south, — Texas or Florida? *See map on page 126.*

Describe the climate of this group of states and territories. *See maps on pages 21, 24, 128 and 129.*

Describe the delta of the Mississippi. What have you learned about the flood plains of this river? *See lesson 53.*

What have you read about the Texas prairies? *See lesson 51.* What region is on the west of these prairies? How do you account for its dryness? *See lesson 50.*

Which part of this section is the most thickly settled? Why? *See map on page 124.* Locate the capitals of these states and territories.

### 153. Southern Group, — Western Section.

The products and industries of this section resemble those of the states farther east. Rice thrives in the swamps along the coast and in the river valleys; sugar cane abounds in the flood and delta plains; forests of yellow pine and other trees cover large areas; cotton, grain and tobacco grow in abundance; large numbers of cattle and sheep graze in the western portion of the section, especially in Texas.

Among the states of our country, Texas takes first rank for cotton and cattle. Louisiana produces more sugar cane and rice than any other state.

LOUISIANA. **New Orleans** has an excellent harbor on the Mississippi river and has grown to be the largest city in the Southern states. Though its import trade in foreign goods is not large, yet its foreign *export* trade surpasses that of every other city in the Union, except New York. New Orleans sends yearly to Europe cotton valued at nearly $100,000,000. This city has also a very large trade in sugar, rice and corn.

New Orleans has had rapid growth in manufactures. Among the cities of our country, it takes high rank in the refining of sugar.

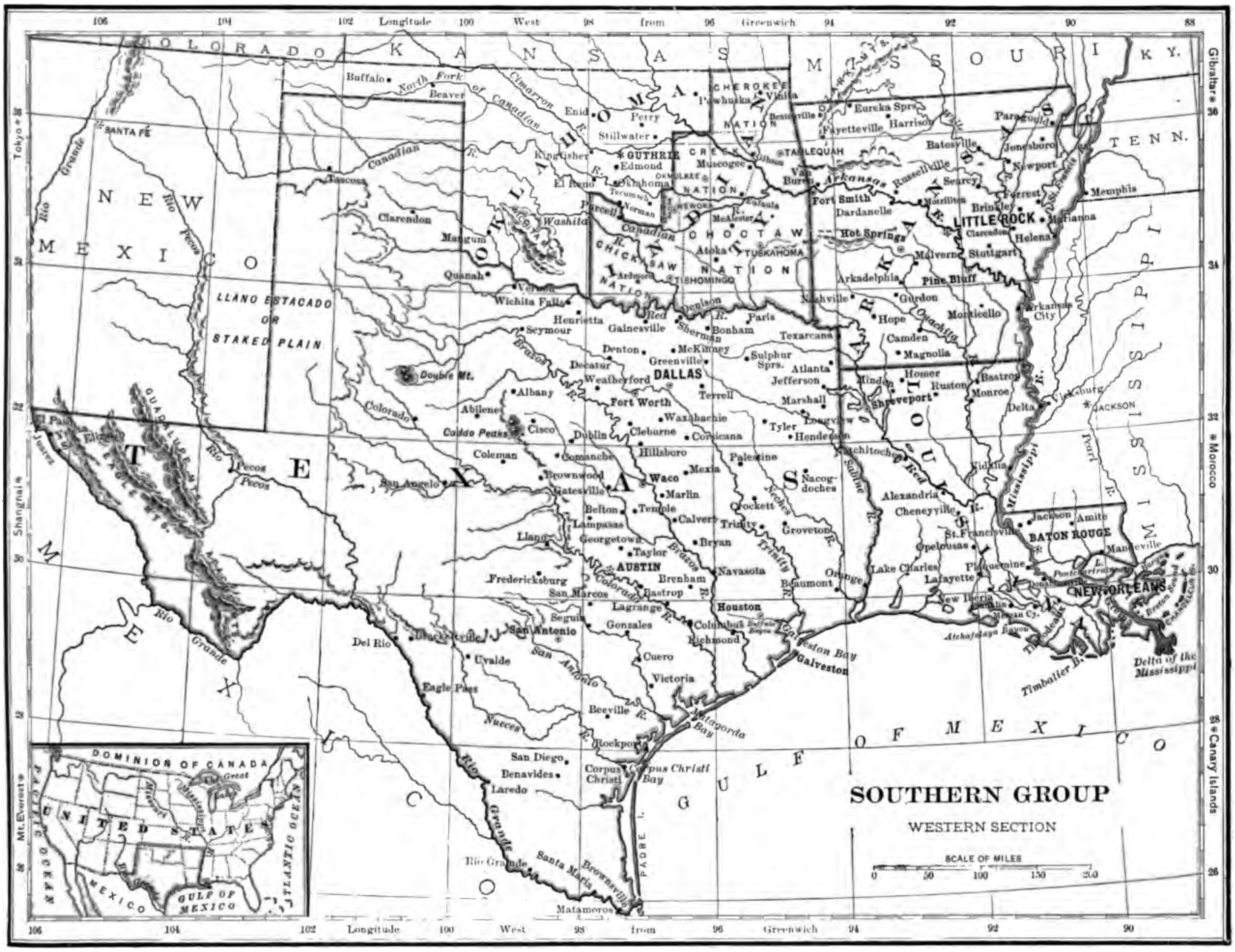
New Orleans is an important railroad center. The *Southern Pacific* system connects it with points westward to the Pacific coast. The *Illinois Central,* the *Queen and Crescent* and other routes lead northward to Chicago, Cincinnati and other cities.

**Shreveport,** on the Red river, is in a rich cotton district. This city is the second cotton market in the state, and has a large river traffic. Steamboat and railroad lines connect Shreveport with New Orleans.

TEXAS. Texas is the largest state in the Union. Its area is greater than that of all the New England and Middle states together. The state of Texas may be divided into three districts, each of which is as large as Great Britain.

**Dallas and Fort Worth** are in the northeastern part of the Texas prairies, — in a rich farming and grazing district. Both these cities handle great quantities of wheat and corn; and both have large flouring mills.

Dallas is a leading market for farming implements. Fort Worth has great stock yards. Many cattle are sent from this district to northern markets.



**San Antonio** is an important center on the Southern Pacific railroad, and on the main railroad line running southward into Mexico. This city is the trade center of southwest Texas.

San Antonio is famous in the history of Texas. Not long after the United States purchased the vast territory of Louisiana west of the Mississippi river, thousands of Americans crossed the border and settled in Texas, which was then a part of Mexico. When the Mexicans tried to oppress the Americans, the latter rose in arms and won the freedom of their state.

One of the fiercest struggles in this war took place in a building known as the *Alamo*, in San Antonio. Here a small band of Americans was attacked by a large force of Mexicans. The Americans fell fighting to the last, rather than surrender. Texas was soon afterwards admitted into the Union.

**Galveston** ranks high among the cotton ports of our country. Among its other exports are hides and wool.

**Houston** is an important railroad center, and is situated on the navigable *Buffalo Bayou.*

ARKANSAS. **Little Rock** is the capital and largest city in Arkansas. Large quantities of cotton-seed oil and oil-cake are made in this city.

**Fort Smith** is a trade center in the western part of the state. **Hot Springs** is a well-known resort for invalids.

OKLAHOMA. This territory was opened to white settlers in 1889, and is now only thinly settled. Corn and cotton are raised in some parts, while others are suitable only for grazing. **Oklahoma** and **Guthrie** are the principal towns.

INDIAN TERRITORY. **Tahlequah,** the capital of the Cherokee nation, is the leading town in this territory.

### 154. Review and Map Studies.

Which is farthest north, — Chicago, Boston or Rome (Italy)?

Which of the states in this section border on Lake Michigan? Which state has the longest lake coast?

Study the maps on pages 21, 24, 128 and 129, and then tell what you can about the climate of this group of states.

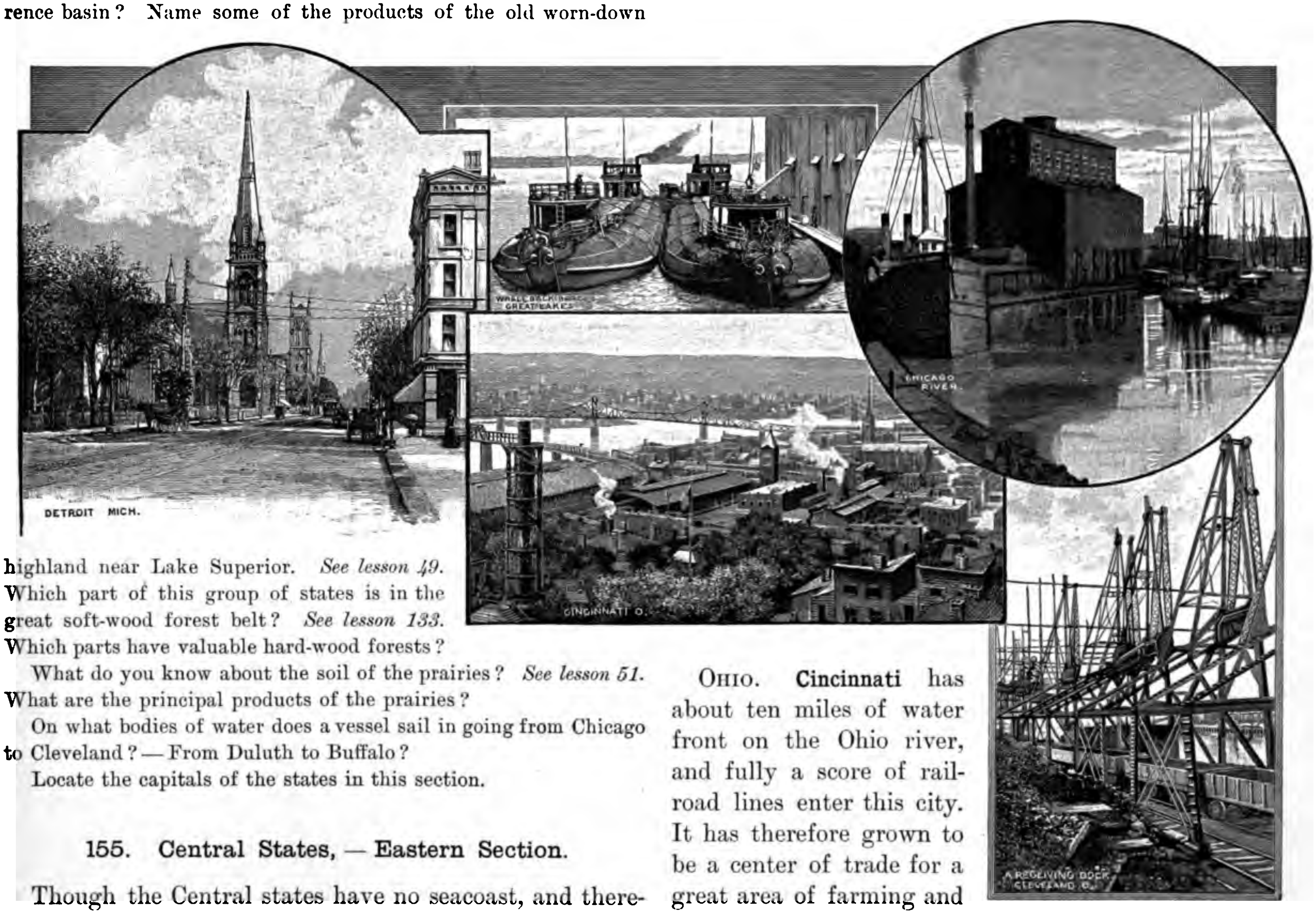
Which part of this section is mountainous? Which of the states in this group are partly within the Alleghany plateau region? Describe this part of the plateau. Name some of its products. *See lessons 47, 136, 137, 140 and 142.*

Which of the states of this group lie partly within the St. Lawrence basin? Name some of the products of the old worn-down highland near Lake Superior. *See lesson 49.* Which part of this group of states is in the great soft-wood forest belt? *See lesson 133.* Which parts have valuable hard-wood forests?

What do you know about the soil of the prairies? *See lesson 51.* What are the principal products of the prairies?

On what bodies of water does a vessel sail in going from Chicago to Cleveland? — From Duluth to Buffalo?

Locate the capitals of the states in this section.


DETROIT MICH.
WHALEBACKS GREAT LAKES
CHICAGO RIVER
CINCINNATI O.
A RECEIVING DOCK CLEVELAND O.

### 155. Central States, — Eastern Section.

Though the Central states have no seacoast, and therefore little foreign commerce, yet they have fine water ways for inland commerce on the Great Lakes and the Mississippi system. Moreover, most of the section is so level or so gently rolling that railroads are built at small expense, and freight rates by rail are therefore low.

These states form the best farming and grazing district in our country, so that meat-packing and flour-milling are very important industries. The iron mines in the Lake Superior region are without a rival. The copper mines in the same district are only slightly surpassed by those of Montana.

The pine forests around the upper lakes, and the hard-wood forests a little farther south, give this section first rank in lumber, as well as in the manufacture of farming machines, furniture and carriages. Beds of soft coal, and wells of natural gas, supply fuel for the extensive manufactures. The eastern and southern portions of this section hold first place in the production of wool, tobacco and hemp.

Such are the natural advantages and fruitful industries of the Central states to-day, although many people are still living who can recall the time when most of the region was a wilderness, and when even Chicago was only a frontier trading town on the small river which now flows through the second largest city in all America.

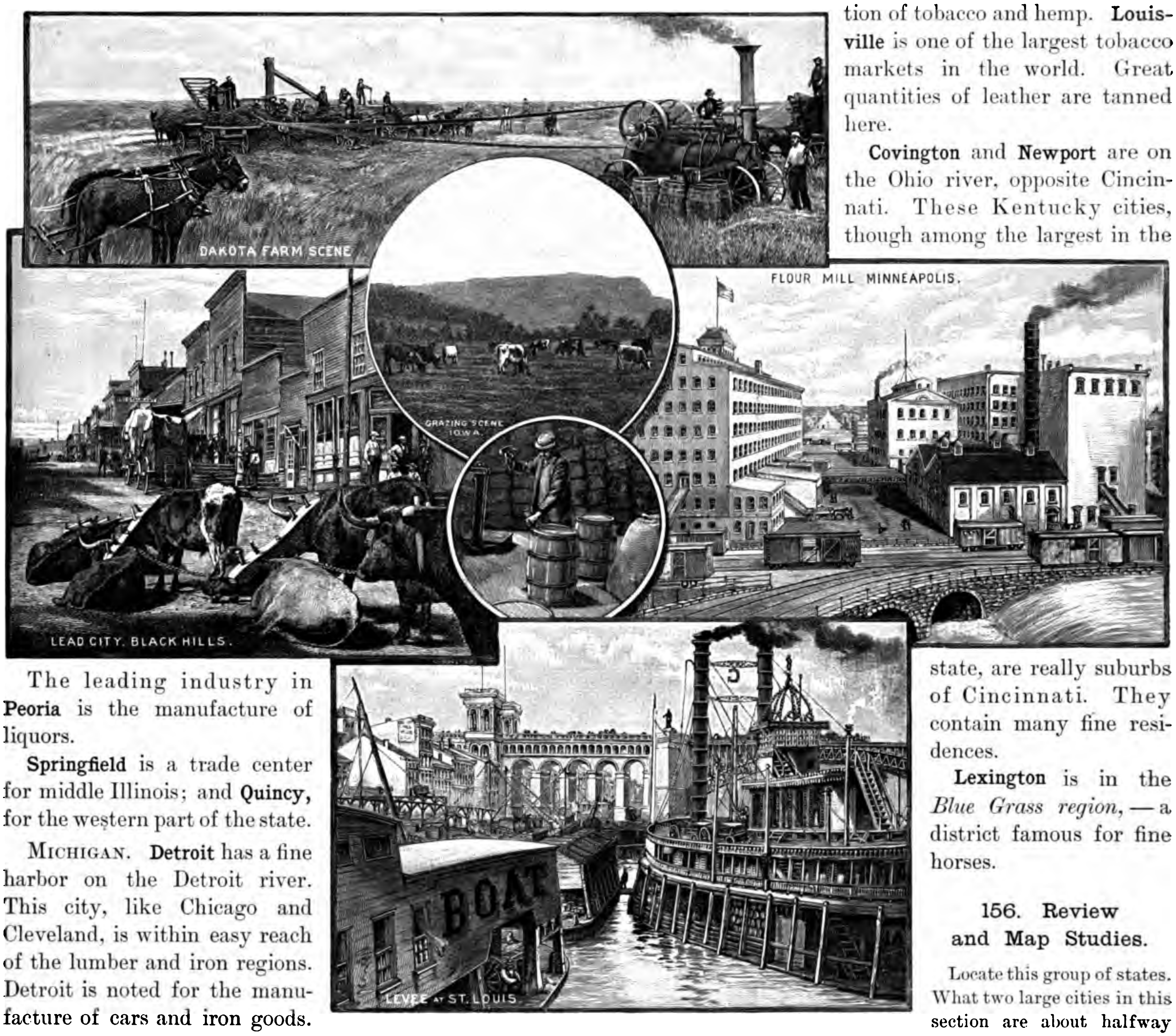
OHIO. **Cincinnati** has about ten miles of water front on the Ohio river, and fully a score of railroad lines enter this city. It has therefore grown to be a center of trade for a great area of farming and grazing country. The chief manufactures of Cincinnati are clothing and liquors. Large numbers of cattle and hogs are raised in the Ohio valley, and many of these are sold in Cincinnati. Meat-packing is therefore an important industry. Many kinds of iron goods also are made here.

**Cleveland** is within easy reach of the coal fields of Ohio and Pennsylvania; of the oil districts in the same states; of the iron mines of the Lake Superior region; of the soft-wood forests of Michigan, and the hard-wood forests of Ohio.

With these advantages, Cleveland has become a leading city in iron and steel manufactures, in oil refining, in shipbuilding, and in other great industries. More petroleum is refined in Cleveland than in any other city of the Union.

What have you learned about the Great Lakes as a water way? *See lessons 49 and 120.*

Among the railroad lines which center in Chicago are the following: the *Lake Shore and Michigan Southern* from Buffalo; the *Pittsburg and Fort Wayne* from Pittsburg; the *Illinois Central* from New Orleans; the *Atchison, Topeka and Santa Fé* from southern California; the *Wabash* from Kansas City and St. Louis; the *Chicago, Milwaukee and St. Paul* from Minneapolis and St. Paul.


DAKOTA FARM SCENE.
GRAZING SCENE IOWA.
FLOUR MILL MINNEAPOLIS.
LEAD CITY, BLACK HILLS.
BOAT
LEVEE AT ST. LOUIS.

The leading industry in **Peoria** is the manufacture of liquors.

**Springfield** is a trade center for middle Illinois; and **Quincy,** for the western part of the state.

Michigan. **Detroit** has a fine harbor on the Detroit river. This city, like Chicago and Cleveland, is within easy reach of the lumber and iron regions. Detroit is noted for the manufacture of cars and iron goods.

**Grand Rapids** has excellent water power in falls of the Grand river, and is also near the lumber districts. No other city in the lake region, except Chicago, manufactures as much furniture.

**Saginaw, Bay City** and **Muskegon** have an immense trade in lumber. The most productive salt-works in our country are in the district near the head of Saginaw bay.

Wisconsin. **Milwaukee** is the second city in size on Lake Michigan. This port has an excellent harbor, and carries on an extensive lake commerce similar to that of Chicago, though much less in value. The chief manufactures of Milwaukee are liquors and flour. Large quantities of meat are packed here.

**Lacrosse, Oshkosh** and **Eauclaire** are lumber markets.

**Racine** is one of the cities which manufacture wagons and farming implements.

Kentucky. This state takes the lead in the cultivation of tobacco and hemp. **Louisville** is one of the largest tobacco markets in the world. Great quantities of leather are tanned here.

**Covington** and **Newport** are on the Ohio river, opposite Cincinnati. These Kentucky cities, though among the largest in the state, are really suburbs of Cincinnati. They contain many fine residences.

**Lexington** is in the *Blue Grass region,* — a district famous for fine horses.

### 156. Review and Map Studies.

Locate this group of states. What two large cities in this section are about halfway between the equator and the north pole? Which extends farther north, — Maine or Minnesota? Which states in this group are west of Illinois?

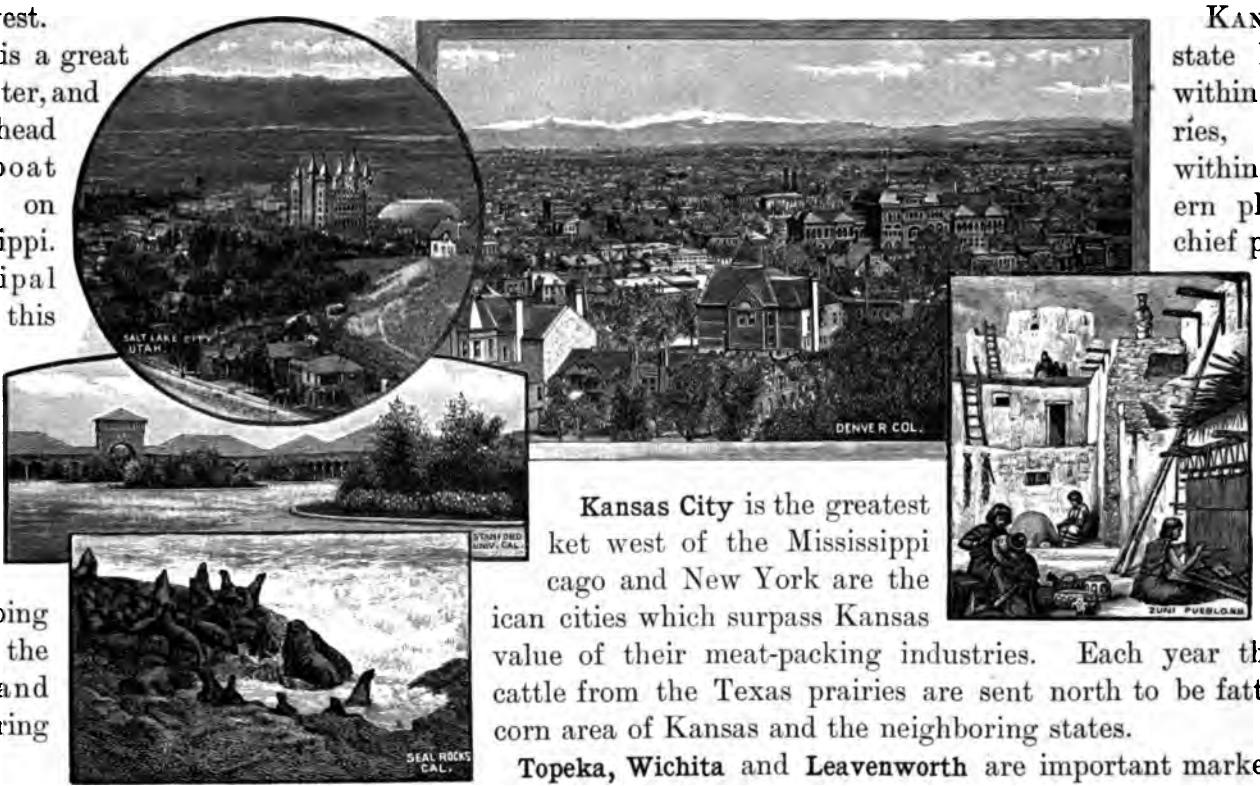
What do the maps on pages 21, 24, 128 and 129 show about the climate of this group of Central states?

Where does the Mississippi river rise? What river of the Nelson system rises near by? How do you account for the richness of the soil in the Red river prairies? *See lesson 51.*

In which states do the prairies merge into the Western plains?

Describe the general course of the Missouri river across this group of states. Across which state does the Platte river flow? Where are the Black hills? What do they yield? *See lesson 50.*

in the Union produces one half as much flour. More than one fourth of Minnesota is covered with forests of white pine. The Mississippi river above Minneapolis is fed by many streams from the forest area, and this city has therefore become the leading lumber market in the Northwest.


SALT LAKE CITY UTAH
DENVER COL.
STANFORD UNIV. CAL.
SEAL ROCKS CAL.
ZUNI PUEBLOS

**St. Paul** is a great railroad center, and is at the head of steamboat navigation on the Mississippi. The principal industry of this city consists in gathering the products of the surrounding region, and in shipping supplies to the farming and the lumbering districts.

**Duluth** is the eastern terminus of the Northern Pacific railroad, and is at the southwestern end of Lake Superior. This city is the outlet of the wheat district in the Red river prairies.

**Winona** is a lumber market on the Mississippi river.

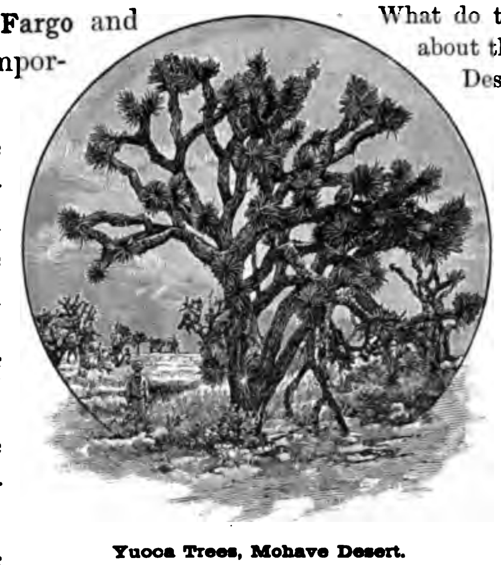
NORTH DAKOTA. This state lies north of the corn belt, but its wheat district in the Red river valley has no superior. A large part of this state affords excellent grazing land for cattle and sheep. **Fargo** and **Bismarck,** though small, are the most important trade centers.

SOUTH DAKOTA. The prairies in the northeast part of this state form a portion of the famous wheat region which extends also into North Dakota. The southeast part of South Dakota is in the corn belt.

**Sioux Falls** and **Pierre** are points of supply for this state.

The Black hills, with their valuable gold mines, lie mostly within the western part of South Dakota.

NEBRASKA. The best farming land of Nebraska, as of the two Dakotas, is in the eastern half of the state. Corn is the most valuable product. The other half of the state forms part of the Western plains where cattle-raising is the chief occupation.



**Yucca Trees, Mohave Desert.**

**Omaha** is a large railroad center and a shipping point for cattle and grain.

**Lincoln,** the capital, is reached by several railroads and has grown to be the most important trade center in the corn and wheat region of southeastern Nebraska.

KANSAS. This state lies mostly within the prairies, but partly within the Western plains. The chief products are corn, wheat and cattle. The grains grow best in eastern Kansas.

**Kansas City** is the greatest meat market west of the Mississippi river. Chicago and New York are the only American cities which surpass Kansas City in the value of their meat-packing industries. Each year thousands of cattle from the Texas prairies are sent north to be fattened in the corn area of Kansas and the neighboring states.

**Topeka, Wichita** and **Leavenworth** are important market centers in the grain and cattle districts.

### 158. Review and Map Studies.

Locate this group of states and territories? Which are territories? *See lesson 125.*

What portion of the Atlantic coast of our country is due east of California? Which is farther north, — San Francisco or St. Louis?

If a ship were to sail due west from San Francisco, what large Asiatic island would it reach?

What do the maps on pages 21, 24, 128 and 129 show about the climate of this group of states?

Describe the park region of Colorado. *See lesson 34.* Describe the Colorado plateaus. *See lesson 38.* How does the Basin region differ from the Colorado plateau region?

In what respects does the valley of California resemble the plain of Chile? *See lessons 40 and 57.* What are the principal products of the Southwestern states? *See lessons 130, 134, 136 and 143.*

Locate the capitals of the states and territories in this group.

### 159. Southwestern Group.

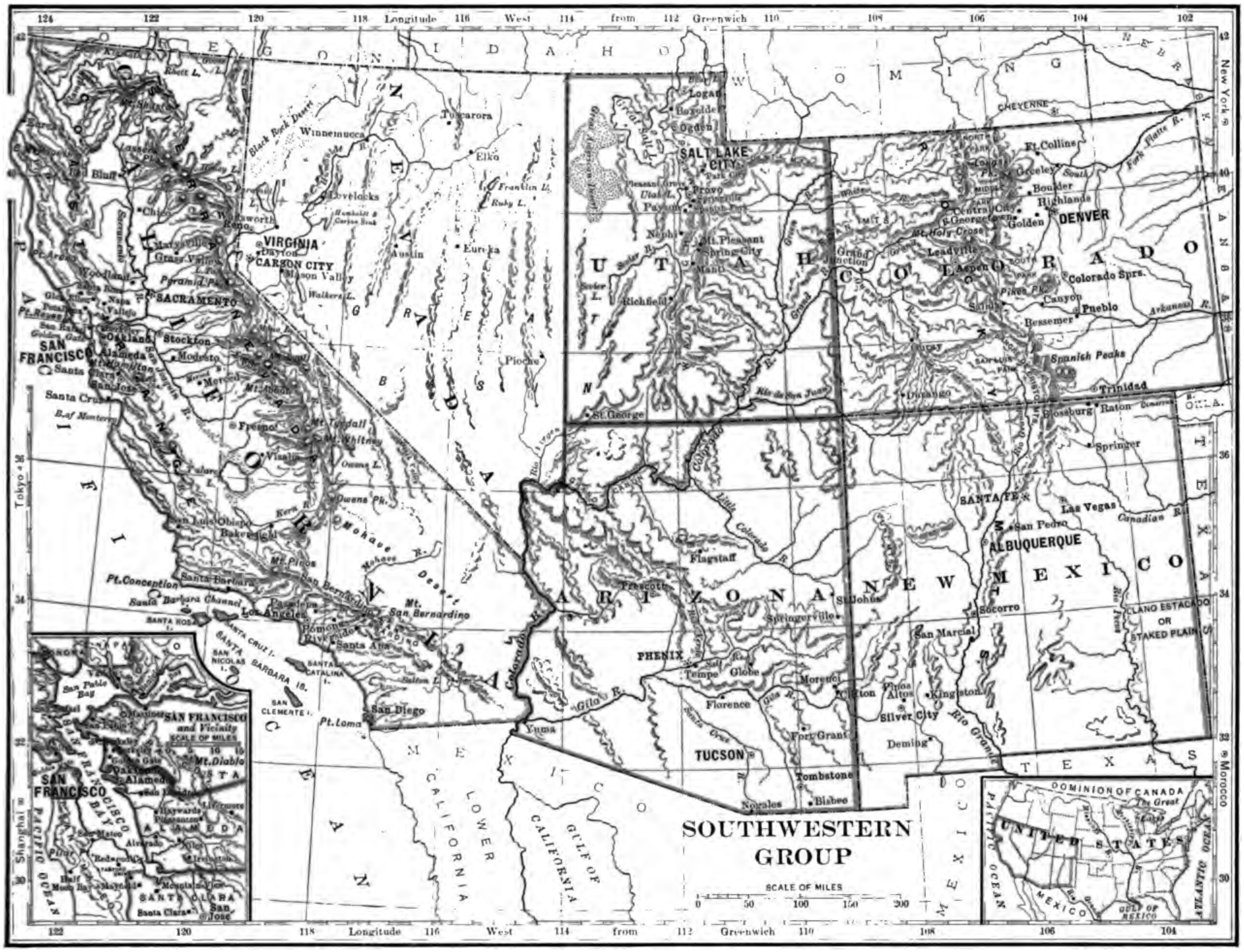
This group of states and territories includes several regions whose industries differ widely from one another. On the east are the grazing lands of the Western plain. Next on the west is the rich mining district of the Rocky mountains. Still farther west and southwest are the thinly settled Basin region and the Colorado plateaus. In the Sierra Nevada is another mining belt and a lumber district. The valley of California is one of the finest wheat and grape regions in the world. The southern portion of this state excels in high grades of oranges. The Coast range yields excellent lumber.

California contains more than half the people in this group of states and territories, yet even this great state has a population smaller than that of New York city.

The raising of cattle and sheep is the principal industry. Silver ore is mined in this state.

**Santa Fé** and **Albuquerque** are the chief trade centers. The former is the second oldest town in our country.

Utah. This state ranks third in the production of silver, — Colorado being first, and Montana second. Some portions of Utah, especially along the small river valleys, are irrigated. They yield grain and vegetables.



Colorado. **Denver** is a supply city for mining districts in the Rocky mountains, and for cattle ranches on the Western plains. Few cities in our country have had a more rapid growth than Denver.

**Pueblo** and **Leadville** have large smelting works. The latter city is in the heart of the Rocky mountains, nearly two miles above sea level. It has been one of the greatest silver-mining cities in the world.

**Colorado Springs** is a well-known resort for invalids.

New Mexico. This territory is mostly in the basin of the Rio Grande.

**Salt Lake City** and **Ogden** are important railroad centers and points of supply.

Arizona. Silver and copper are the principal products of the mines in this territory. Arizona ranks high in the output of copper.

There are good irrigated farms in the basin of the Gila river, west of the Colorado plateau region.

**Tucson** and **Phenix** have a large trade in outfits for miners.

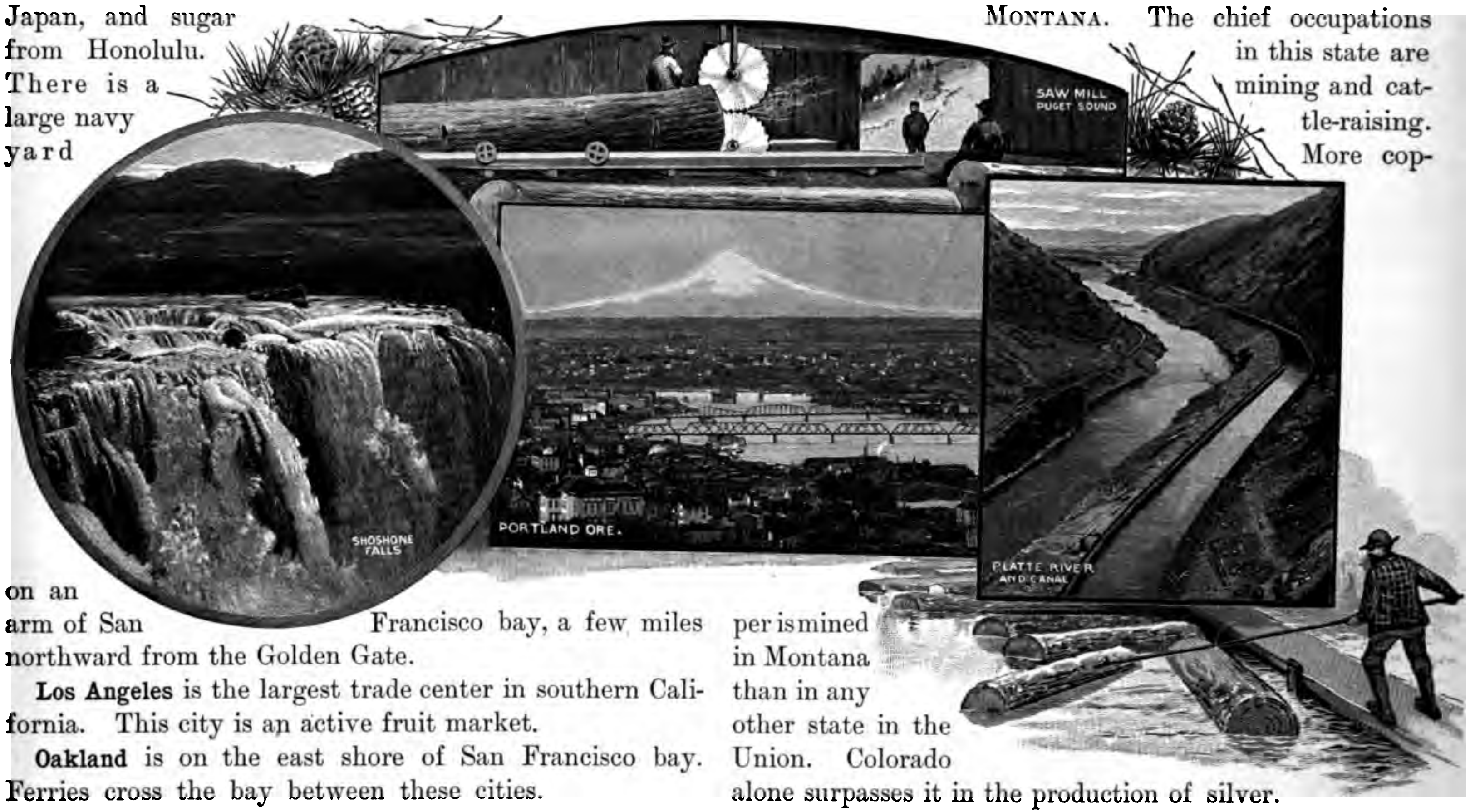
Nevada. Silver and gold mining rank first among this state's industries. The greater part of Nevada is a sagebrush desert.

**Virginia** and **Carson City** are well-known mining centers.

CALIFORNIA. **San Francisco** is the natural outlet for the products of the valley of California. More wheat is exported from this seaport than from any other American city. It leads also in the refining of sugar.

San Francisco has a large inland trade in wheat, flour and fruits. The principal manufactures of the city are clothing, boots and shoes.

Among the imports are silk and tea from China and Japan, and sugar from Honolulu. There is a large navy yard on an arm of San Francisco bay, a few miles northward from the Golden Gate.



**Los Angeles** is the largest trade center in southern California. This city is an active fruit market.

**Oakland** is on the east shore of San Francisco bay. Ferries cross the bay between these cities.

Oakland is largely a city of residences. It is the home of many persons whose business is in San Francisco.

**Sacramento,** the capital, has a large trade in wheat.

### 160. Review and Map Studies.

Which is farther north, — Portland (Oregon) or Montreal?

Refer to the maps on pages 21, 24, 128 and 129, and describe the climate of the Pacific coast of this group. In what respect does the climate of eastern Montana differ from that of western Washington? How do you account for the difference in climate between Oregon and New England?

In what direction do the Rocky mountains extend across this group of states? Which of the states are partly in the Western plains? What valuable minerals are found in Montana? *See lessons 143 and 144.*

What part of this section is buried in ancient lava-flows? *See lesson 39.* Describe the Cascade range; the Coast range. *See lessons 36 and 40.* Why is the seacoast northward from Puget sound so irregular? *See lesson 40.* Name the state capitals in this group.

ALASKA. — Locate Sitka. *See map on page 126.* Which is farther north, — Sitka or St. Petersburg?

Why is the climate of southwestern Alaska so mild? What are the principal products of Alaska? *See lesson 41.*

### 161. Northwestern Group.

The industries in this group of states are similar to those in the group on the south. There are the grazing districts of the Western plains, the mining regions of the Rocky mountains, the barren lava plains, the wheat lands in the Willamette valley, the forested slopes of the Cascade and Coast ranges.

These five states together have a population less than that of either New York or Chicago.

MONTANA. The chief occupations in this state are mining and cattle-raising. More copper is mined in Montana than in any other state in the Union. Colorado alone surpasses it in the production of silver. The gold mines of Montana are very productive.

Both **Helena** and **Butte** have a large trade in mining outfits. There are also extensive smelting works in these cities.

WYOMING. This state has few mines, but it has immense cattle ranches. **Cheyenne** and **Laramie** are the principal trade centers. The former city is one of the largest cattle markets in America, because it is the only shipping point for a large grazing area.

The greater portion of Yellowstone park is in northwest Wyoming.

IDAHO. Mining is the chief industry of Idaho, — with silver, gold and lead as the products. The river valleys in the northern part of this state form a very productive wheat district.

**Boise** is the capital and the trade center of Idaho.

OREGON. The portion of this state east of the Cascade range has large cattle ranches. The Willamette valley is an excellent wheat district. Many sheep are also raised here. The Cascade and Coast ranges are heavily forested, and they yield valuable lumber products. There are extensive salmon fisheries in the Columbia river.

**Portland,** on the Willamette branch of the Columbia river, is the commercial center of the state.

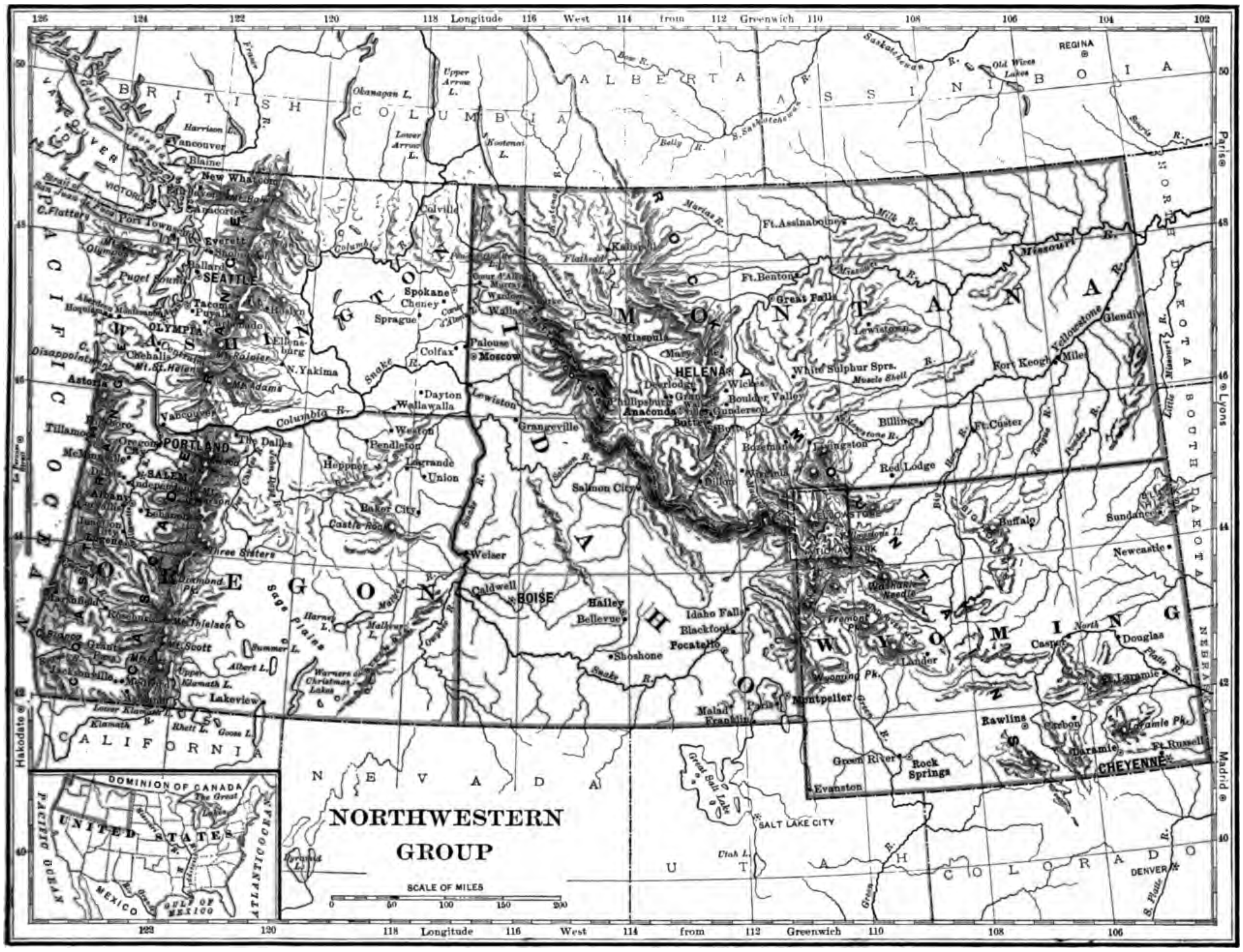
**Salem,** the capital, is in the wheat and the wool district of the Willamette valley.

WASHINGTON. The industries of this state resemble those of Oregon. Wheat is the leading product of middle and southeast Washington. The country around Puget sound is one of the best lumber districts in the world. Coal also abounds here. Washington shares with Oregon the salmon fisheries of the Columbia river.

**Seattle** and **Tacoma** are important cities on Puget sound. They have excellent harbors and are the trade centers of the state. Both are large lumber markets.

**Spokane** is the center of trade in eastern Washington. This city has fine water power.

ALASKA. Two thirds of the people in this territory are Indians. The others are white settlers and Eskimos.



The shore waters and the rivers of Alaska abound in salmon. The canning of this kind of fish is a very important industry. Fur seals in large numbers are taken on the Pribilof islands.

**Sitka** is the capital of the territory. Considerable gold is mined in the district around **Juneau.** *See map of United States in the supplement.*

The first white settlers in Alaska were Russian fur traders. In 1867 Russia sold Alaska to the United States for $7,200,000. This is a small sum compared with the value of the furs, the fish, the gold and the lumber which this northern region yields.

Alaska is about one sixth as large as the rest of our country, but only a small portion of this territory is suitable for the homes of white people.

The best part of Alaska is the southwest coastal region.

Rainfall is plentiful in this northern land, but the warm season is too short to ripen grain.

**Virginia** and **Carson City** are well-known mining centers.

CALIFORNIA. **San Francisco** is the natural outlet for the products of the valley of California. More wheat is exported from this seaport than from any other American city. It leads also in the refining of sugar.

San Francisco has a large inland trade in wheat, flour and fruits. The principal manufactures of the city are clothing, boots and shoes.

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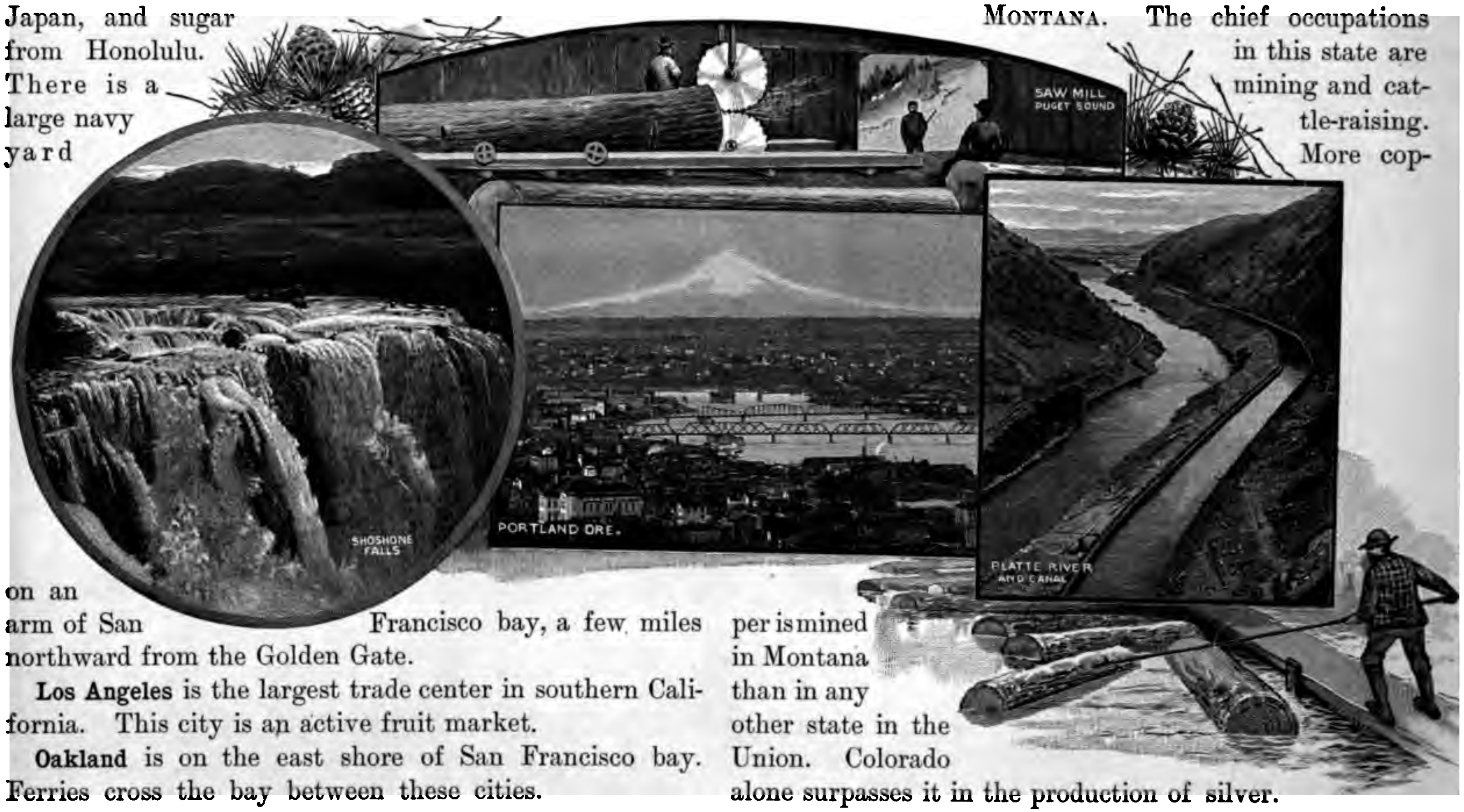

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### 160. Review and Map Studies.

Which is farther north, — Portland (Oregon) or Montreal?

Refer to the maps on pages 21, 24, 128 and 129, and describe the climate of the Pacific coast of this group. In what respect does the climate of eastern Montana differ from that of western Washington? How do you account for the difference in climate between Oregon and New England?

In what direction do the Rocky mountains extend across this group of states? Which of the states are partly in the Western plains? What valuable minerals are found in Montana? *See lessons 143 and 144.*

What part of this section is buried in ancient lava-flows? *See lesson 39.* Describe the Cascade range; the Coast range. *See lessons 36 and 40.* Why is the seacoast northward from Puget sound so irregular? *See lesson 40.* Name the state capitals in this group.

ALASKA. — Locate Sitka. *See map on page 126.* Which is farther north, — Sitka or St. Petersburg?

Why is the climate of southwestern Alaska so mild? What are the principal products of Alaska? *See lesson 41.*

### 161. Northwestern Group.

The industries in this group of states are similar to those in the group on the south. There are the grazing districts of the Western plains, the mining regions of the Rocky mountains, the barren lava plains, the wheat lands in the Willamette valley, the forested slopes of the Cascade and Coast ranges.

These five states together have a population less than that of either New York or Chicago.

MONTANA. The chief occupations in this state are mining and cattle-raising. More copper is mined in Montana than in any other state in the Union. Colorado alone surpasses it in the production of silver. The gold mines of Montana are very productive.

Both **Helena** and **Butte** have a large trade in mining outfits. There are also extensive smelting works in these cities.

WYOMING. This state has few mines, but it has immense cattle ranches. **Cheyenne** and **Laramie** are the principal trade centers. The former city is one of the largest cattle markets in America, because it is the only shipping point for a large grazing area.

The greater portion of Yellowstone park is in northwest Wyoming.

IDAHO. Mining is the chief industry of Idaho, — with silver, gold and lead as the products. The river valleys in the northern part of this state form a very productive wheat district.

**Boise** is the capital and the trade center of Idaho.

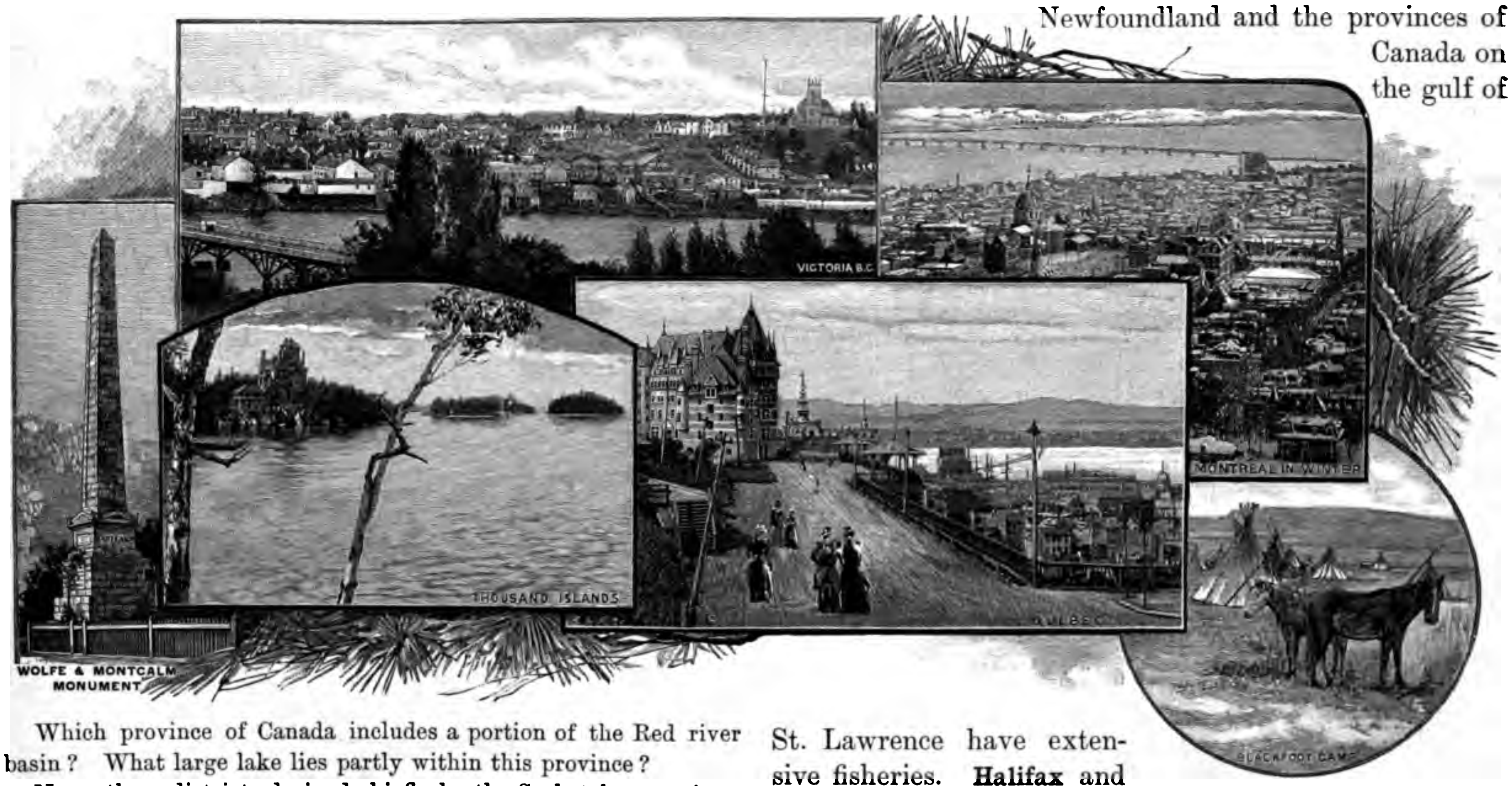
OREGON. The portion of this state east of the Cascade range has large cattle ranches. The Willamette valley is an excellent wheat district. Many sheep are also raised here. The Cascade and Coast ranges are heavily

### 162. Review and Map Studies.

NOTE: The *Dominion of Canada* consists of various *provinces, districts* and *territories.* Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario, Manitoba and British Columbia are provinces; the other divisions, except the Northwest and the Northeast territories, are districts. The province of Newfoundland, including the northern district of Labrador, is not a part of Canada; but both Newfoundland and Canada belong to the British Empire.

What large bodies of water partly surround the province of Ontario? What river separates Ontario from New York? Through what province does the St. Lawrence river flow?

Locate Nova Scotia; — New Brunswick; — Prince Edward Island. What large island forms the northern part of the province of Nova Scotia? Between what provinces is the bay of Fundy?



Which province of Canada includes a portion of the Red river basin? What large lake lies partly within this province?

Name three districts drained chiefly by the Saskatchewan river. What district and province meet in the Rocky mountains? Which province is almost wholly within the Rocky Mountain highland? Name a large island belonging to this province.

Name three large lakes that form part of the Mackenzie system. In what territory is the greater part of the Mackenzie basin? What do the maps on pages 21 and 24 show about the climate of Canada? *See also lessons 48, 52 and 127.*

### 163. Canada and Newfoundland.

Canada is about equal in area to the United States, but the population of the former is less than one twelfth that of the latter.[1] The provinces of Canada, — in their surface, their products and their climate, — resemble the portions of our country which they adjoin; but the winter climate of Canada, except in British Columbia and southeast Ontario, is more severe than that of the states along our northern border.

The best portion of Canada is the region lying among lakes Huron, Erie and Ontario, and thence extending along the St. Lawrence river to Quebec. This region includes parts of both Ontario and Quebec. Barley and wheat thrive here; soft-wood forests abound; and large numbers of sheep and cattle find excellent pasturage.

In this productive area are found most of the large cities of Canada. Among these are **Montreal, Toronto, Quebec, Hamilton** and **Ottawa.** These cities have a large trade in lumber, barley, sheep and wool, cattle and hides.

Newfoundland and the provinces of Canada on the gulf of St. Lawrence have extensive fisheries. **Halifax** and **St. John's** send large quantities of codfish to our country. Most of these fish are caught on the banks of Newfoundland.

New Brunswick, like Maine, is in the forest belt. **St. John** exports lumber, largely to the United States.

The province of Manitoba includes parts of the Red river prairie region. **Winnipeg** therefore exports wheat. British Columbia, like the state of Washington, has valuable coal mines, forests and fisheries. This province yields large amounts of gold. The chief city of the province is **Victoria,** on Vancouver Island.

### 164. Review and Map Studies.

MEXICO. What bodies of water partly surround Mexico? Describe the highland of Mexico. *See lesson 42.* What have you learned about the coastal region of this country? Where is the isthmus of Tehuantepec?

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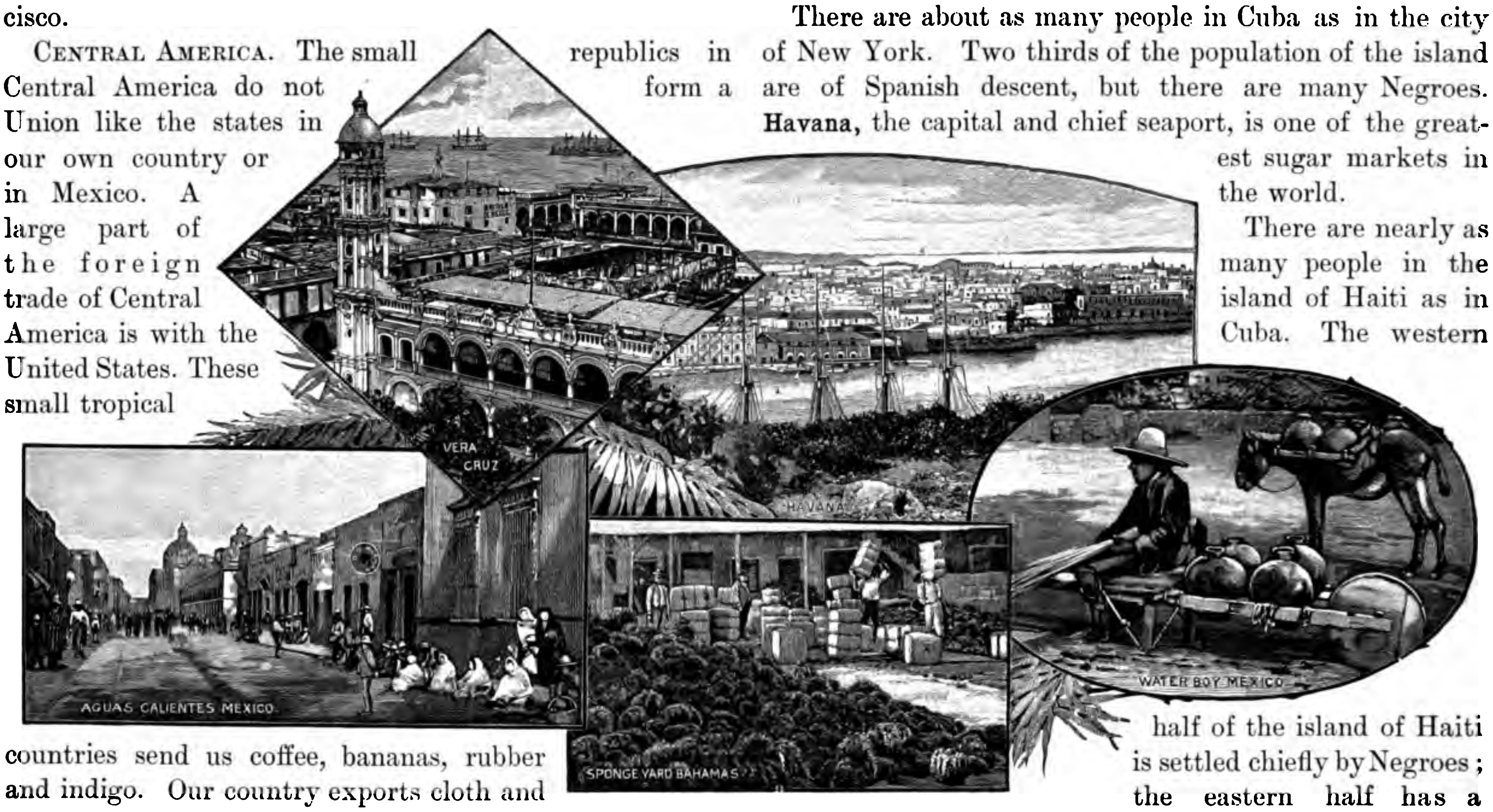
[1] A large part of Canada once belonged to France, and many people of French descent live in this portion of North America. They are now greatly outnumbered by the English-speaking population.

**Mexico,** the capital and principal city of the republic, has a population somewhat larger than that of San Francisco.

CENTRAL AMERICA. The small republics in Central America do not form a Union like the states in our own country or in Mexico. A large part of the foreign trade of Central America is with the United States. These small tropical countries send us coffee, bananas, rubber and indigo. Our country exports cloth and hardware to the Central American republics.



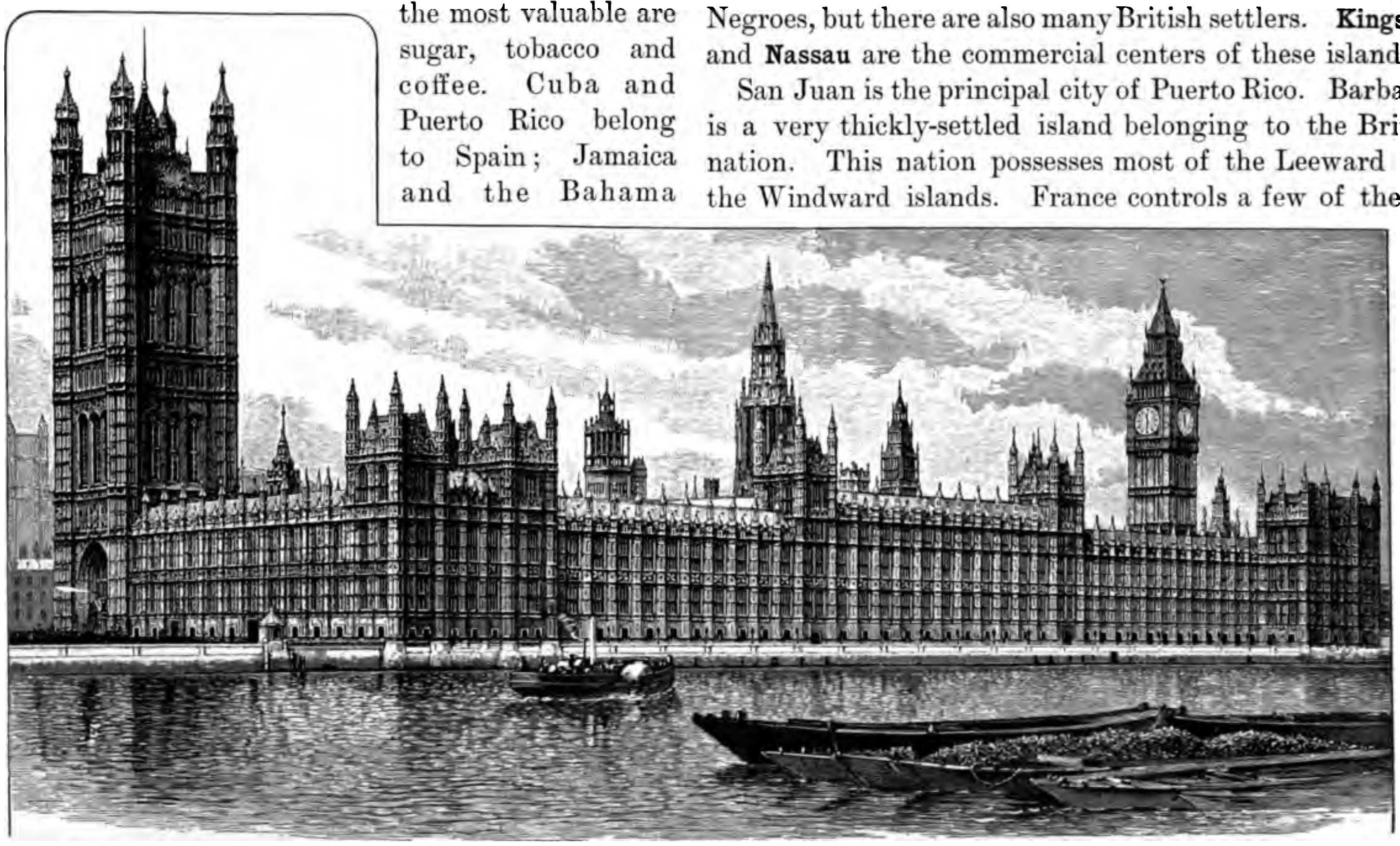
WEST INDIES. The name *West Indies* is given to the groups of islands which partly inclose the gulf of Mexico and the Caribbean sea. The products of these islands are similar to those of Mexico and Central America, but the most valuable are sugar, tobacco and coffee. Cuba and Puerto Rico belong to Spain; Jamaica and the Bahama islands to Great Britain. The island of Haiti comprises the two small republics of Haiti and Santo Domingo.

There are about as many people in Cuba as in the city of New York. Two thirds of the population of the island are of Spanish descent, but there are many Negroes. **Havana,** the capital and chief seaport, is one of the greatest sugar markets in the world.

There are nearly as many people in the island of Haiti as in Cuba. The western half of the island of Haiti is settled chiefly by Negroes; the eastern half has a mixed population of Negroes and people of Spanish descent. The latter outnumber the former. **Port au Prince** and **Santo Domingo** are the principal cities of the island.

Jamaica and the Bahama islands are peopled largely by Negroes, but there are also many British settlers. **Kingston** and **Nassau** are the commercial centers of these islands.

San Juan is the principal city of Puerto Rico. Barbados is a very thickly-settled island belonging to the British nation. This nation possesses most of the Leeward and the Windward islands. France controls a few of them.



**Westminster Palace, on the Thames, London.**

# EUROPE.

## 166. Review and Map Studies.

Which parts of Europe are mountainous? Which are lowland? In what two regions do most of the large rivers of Europe rise?

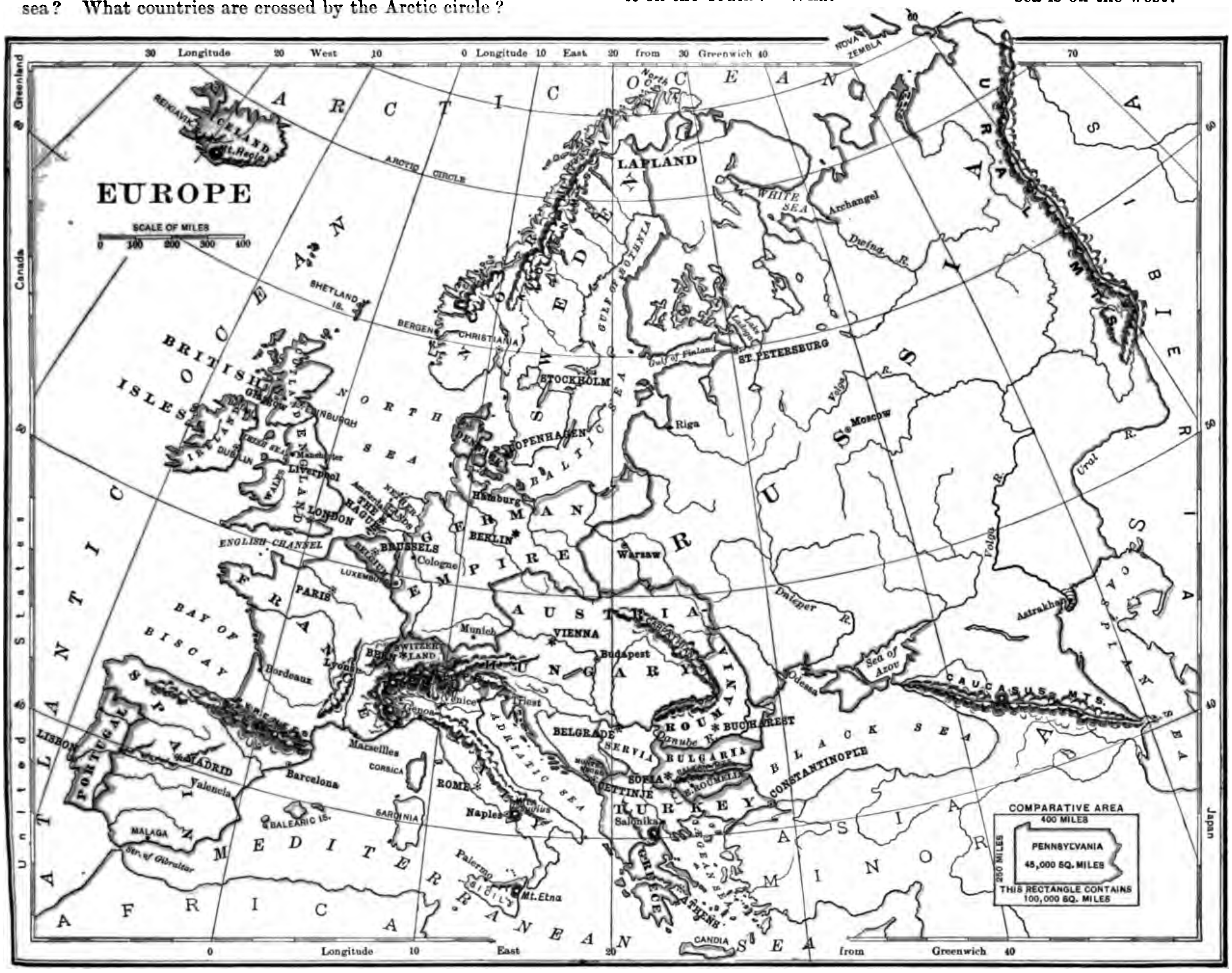
What countries are grouped about the Swiss plateau? Which of these countries border on the Mediterranean sea or its branches?

What countries are wholly or partly included in Low Europe? Which of these countries border on the North sea? — On the Baltic sea? What countries lie along the west coast of the Black sea? What countries are crossed by the Arctic circle?

**Norway, Sweden and Denmark.** What part of the coast of North America lies due west of Norway? How do you account for the mildness of the climate on the west coast of Norway? *See lesson 82.*

Describe the surface of Norway and Sweden. Into what sea and gulf do most of the rivers of Sweden flow? What are some of the products of the Scandinavian peninsula?

What kind of surface has Denmark? What country adjoins it on the south? What sea is on the west?



Where is the Ægean sea? — The Adriatic sea? — The bay of Biscay? — The gulf of Bothnia? — The sea of Azov?

**Spain and Portugal.** What part of the Atlantic coast of America is due west of Spain? In what direction are the British Isles from the Spanish peninsula? Locate Portugal.

Describe the surface of the Spanish peninsula. *See lesson 78.* What do you know about its climate? Name the principal products of Spain and Portugal.

What bodies of water partly surround the Spanish peninsula? What nation controls the Rock of Gibraltar? Where are the Balearic islands?

**Russia.** Describe the surface of Russia. *See lesson 85.* How were the many lakes and falls of Finland formed?

Describe the climate of the great Russian plain. *See maps on pages 21 and 24; also lesson 85.* What are the leading products of Russia?

Describe the course of the Volga river; — of the Ural river. Where is the Dwina river? — The Dnieper river?

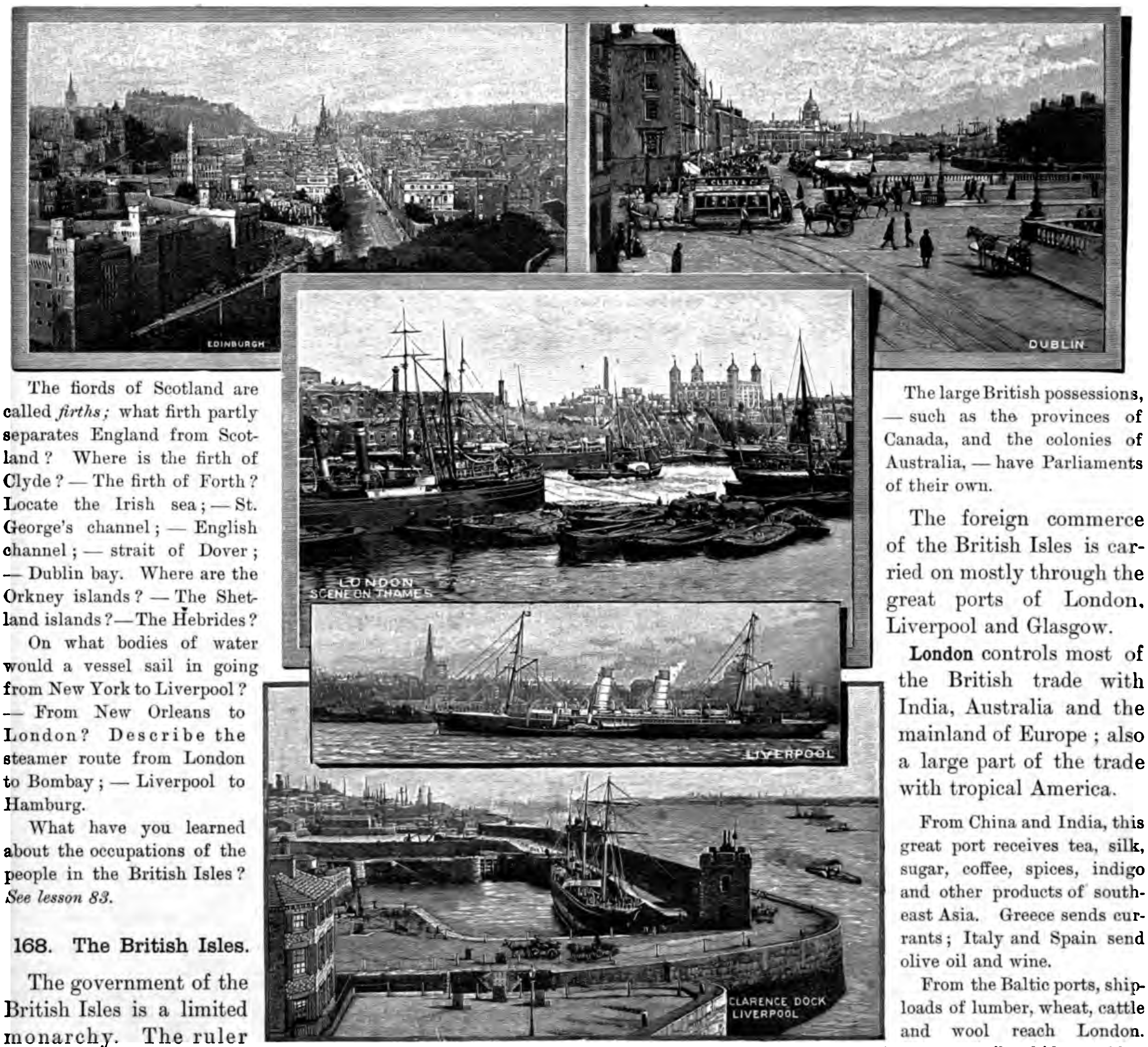
Locate Lake Ladoga; — the gulf of Finland.

Name the seas which partly surround Russia. On what large bodies of water would a vessel sail in going from Odessa to St. Petersburg? What countries of Europe border on Russia?

### 167. Review and Map Study.

Describe the surface of Scotland; — of England; — of Wales; — of Ireland. *See map on opposite page; also lesson 83.* Locate the Cheviot hills; — the Grampians; — Ben-Nevis; — Snowdon.

What part of Ireland is drained by the Shannon river? Why are the Thames and the Mersey rivers so deep? *See lesson 83.* What have you learned about the basin of the Clyde river? Why is the northwest coast of the British Isles so irregular?



The fiords of Scotland are called *firths;* what firth partly separates England from Scotland? Where is the firth of Clyde? — The firth of Forth? Locate the Irish sea; — St. George's channel; — English channel; — strait of Dover; — Dublin bay. Where are the Orkney islands? — The Shetland islands? — The Hebrides?

On what bodies of water would a vessel sail in going from New York to Liverpool? — From New Orleans to London? Describe the steamer route from London to Bombay; — Liverpool to Hamburg.

What have you learned about the occupations of the people in the British Isles? *See lesson 83.*

### 168. The British Isles.

The government of the British Isles is a limited monarchy. The ruler holds office by claim of birth, but her authority is limited. The law-making power is given to Parliament.[1]

Parliament consists of two bodies, — the House of Commons and the House of Lords. The members of the former are elected by the people; the members of the latter are nobles and bishops.

The execution of the laws is in the hands of a Prime Minister who is assisted by a *Cabinet.* As in our government, the members of the Cabinet supervise the foreign affairs, the treasury, the army and other departments.

The British Isles constitute the *United Kingdom of Great Britain and Ireland.* The United Kingdom, with all British colonies and other possessions, forms the *British Empire.* The ruler of this empire appoints a *Governor* or a *Governor-General* for each colony. Some of the colonies take no part in governing themselves. Others elect their own officers, except Governors; but the British ruler retains authority to veto any bill passed by a colonial government.

The large British possessions, — such as the provinces of Canada, and the colonies of Australia, — have Parliaments of their own.

The foreign commerce of the British Isles is carried on mostly through the great ports of London, Liverpool and Glasgow.

**London** controls most of the British trade with India, Australia and the mainland of Europe; also a large part of the trade with tropical America.

From China and India, this great port receives tea, silk, sugar, coffee, spices, indigo and other products of south-east Asia. Greece sends currants; Italy and Spain send olive oil and wine.

From the Baltic ports, shiploads of lumber, wheat, cattle and wool reach London. Steamers from tropical America bring sugar, coffee, hides, rubber and cocoa. Australia ships chiefly wool and gold.

London, with its great trade, has grown to be the largest city and one of the chief seaports in the world.

**Liverpool** is the principal port for the manufacturing district of northwest England. This port receives the raw materials from abroad, and ships away the manufactured products.

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[1] Parliament meets in Westminster palace, London. *See page 160.*

The United States sends more products to Liverpool than to any other port in the world. Most valuable among these are cotton, grain and meats. Large quantities of wool are sent from the Argentine Republic and from Australia to Liverpool.

The exports of Liverpool are mostly cotton, woolen and silk cloth; cutlery and other kinds of hardware; heavy iron goods, such as engines, rails and armor plates.

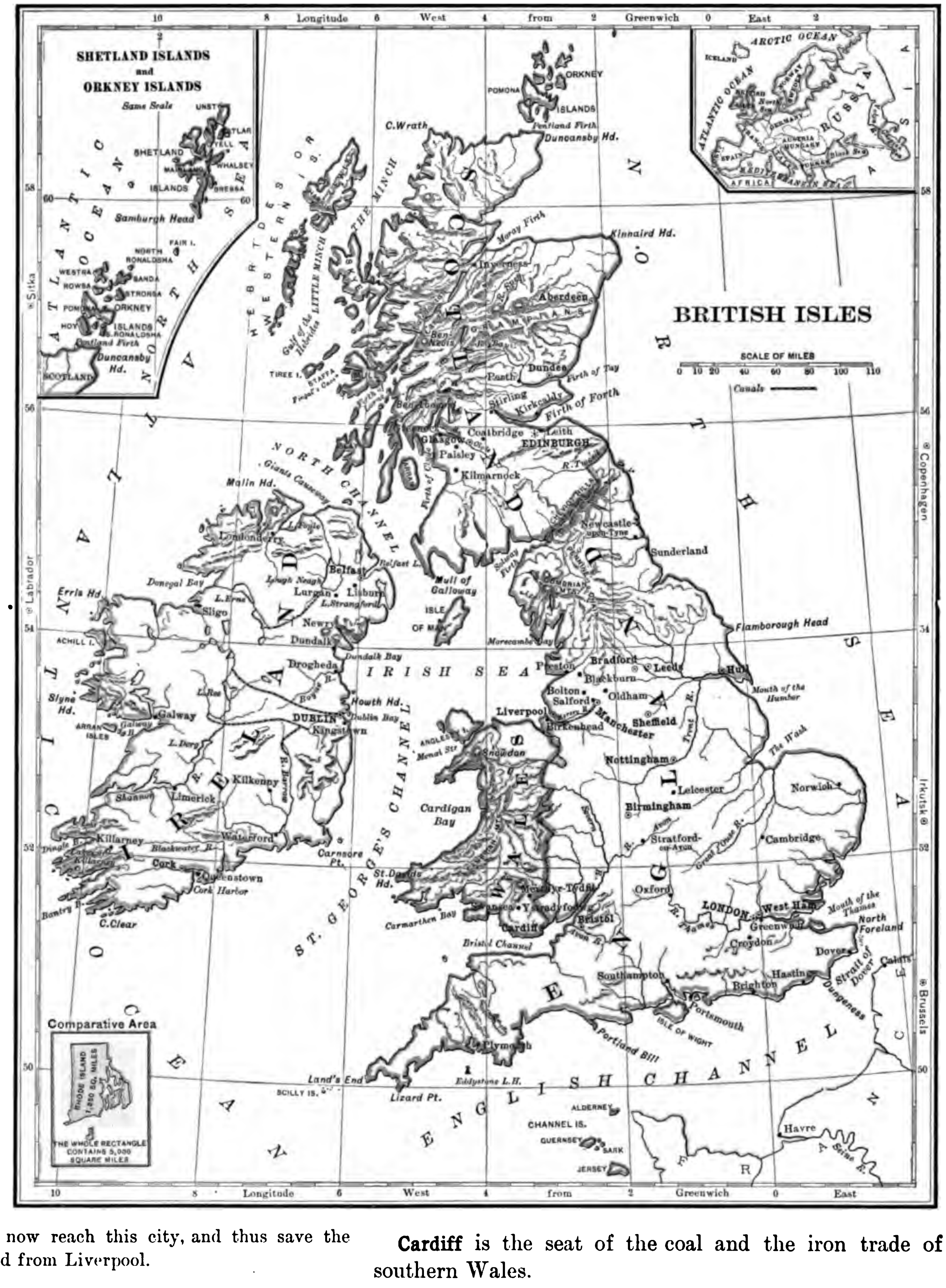
The rise and fall of the tide in the Mersey at Liverpool is so great that many steamers enter inclosed docks to load and unload. In these docks the water can always be kept at the same level. Other steamers use great landing stages that float, — rising and falling with the tide.

**Glasgow** leads all other cities in shipbuilding. The success of this city in making iron steamships is due chiefly to its excellent harbor, its nearness to mines of coal and iron ore, as well as to its skilled workmen. Glasgow carries on a large foreign trade for the manufacturing district of southern Scotland.

**Manchester** is one of the cities which owe their growth to the nearness of coal and iron. This city has the largest cotton mills in the world. Great quantities of woolen cloth also are made here.

A ship canal has lately been built from Manchester to the tidal portion of the Mersey river. Ocean steamers laden with cotton or wool can now reach this city, and thus save the cost of transfer by railroad from Liverpool.

**Birmingham** is famous for its work in metals, — iron, copper and brass. Among its best-known products are screws, nails, pens and firearms. **Sheffield** manufactures heavy iron goods and cutlery. **Bradford** is noted for its woolen manufactures. **Cambridge** and **Oxford** have famous universities. **Dublin** is the center of trade for middle Ireland. **Belfast** manufactures fine Irish linens.



**Cardiff** is the seat of the coal and the iron trade of southern Wales.

**Edinburgh,** the capital of Scotland, contains several colleges. **Dundee** has the largest linen mills in Great Britain.

## 169. Review and Map Studies.

**Germany.** What countries border on Germany? What seas form part of its boundary?

Describe the surface of Germany. *See lesson 84.* Name four rivers that flow across this country. What part of Germany is in the Danube basin?

What winds bring most of the rainfall of Germany? Name some of the products of this country.

**France.** Into what bodies of water do the Rhone, the Gironde and the Seine rivers flow? What strait separates France from England? What mountains partly separate France from Germany? Name the mountain range between France and Spain.

Describe the surface of France. *See lessons 77 and 84.* What are some of the products of this country? Where is Corsica?

**Belgium, the Netherlands and Denmark.** What empire is east of Belgium and the Netherlands? On what sea do they border?

Describe the surface of the land along the southeast shore of the North sea. *See lesson 84.*

**Italy.** What mountains separate Italy from France and Switzerland? What country adjoins Italy on the northeast? Name the bodies of water which partly surround this peninsula.

Describe the Po valley, and name its principal products. *See lesson 79.* What have you learned about the Apennines? — About the slopes on the southwest of the Apennines? Locate Sicily and Sardinia. Name a volcano in Sicily.

**Balkan Countries.** Between what four countries does the Danube flow? Where is Montenegro?

Name three seas that border on Turkey. What countries border on the Adriatic sea?

What have you learned about the surface of the countries in the Balkan peninsula? *See lesson 80.* Why is the coastline of Greece so irregular? Where is Candia?

**Switzerland.** Describe the surface of Switzerland. *See lesson 77.* Name some of the products of this country. What countries surround Switzerland?

**Austria-Hungary.** What countries are on the north of Austria-Hungary? What sea is on the southwest?

Describe the river system which drains the greater part of this empire. Describe the plain of Hungary. *See lesson 81.* What mountain range forms part of the boundary between Roumania and the plain of Hungary?

## 170. Countries of Low Europe, — Western Part.

**Germany.** Germany has rich coal and iron mines, beds of clay for making porcelain, and sand for making glass. The river valleys of this country are famous for their wine grapes. Large areas are planted with sugar beets and with cereals.

This country imports cotton from the United States; wool and flax from Russia and Hungary; raw silk from Italy.

ROTTERDAM

FRANKFURT

BERLIN

PARIS

The principal manufactures of Germany are cloth, iron articles, beet sugar, glass and porcelain. Large quantities of these articles are sent to the United States. Besides cotton, our country sends grain, meat, petroleum and tobacco to Germany, — largely through the port of Hamburg.

Germany ranks second among commercial countries.

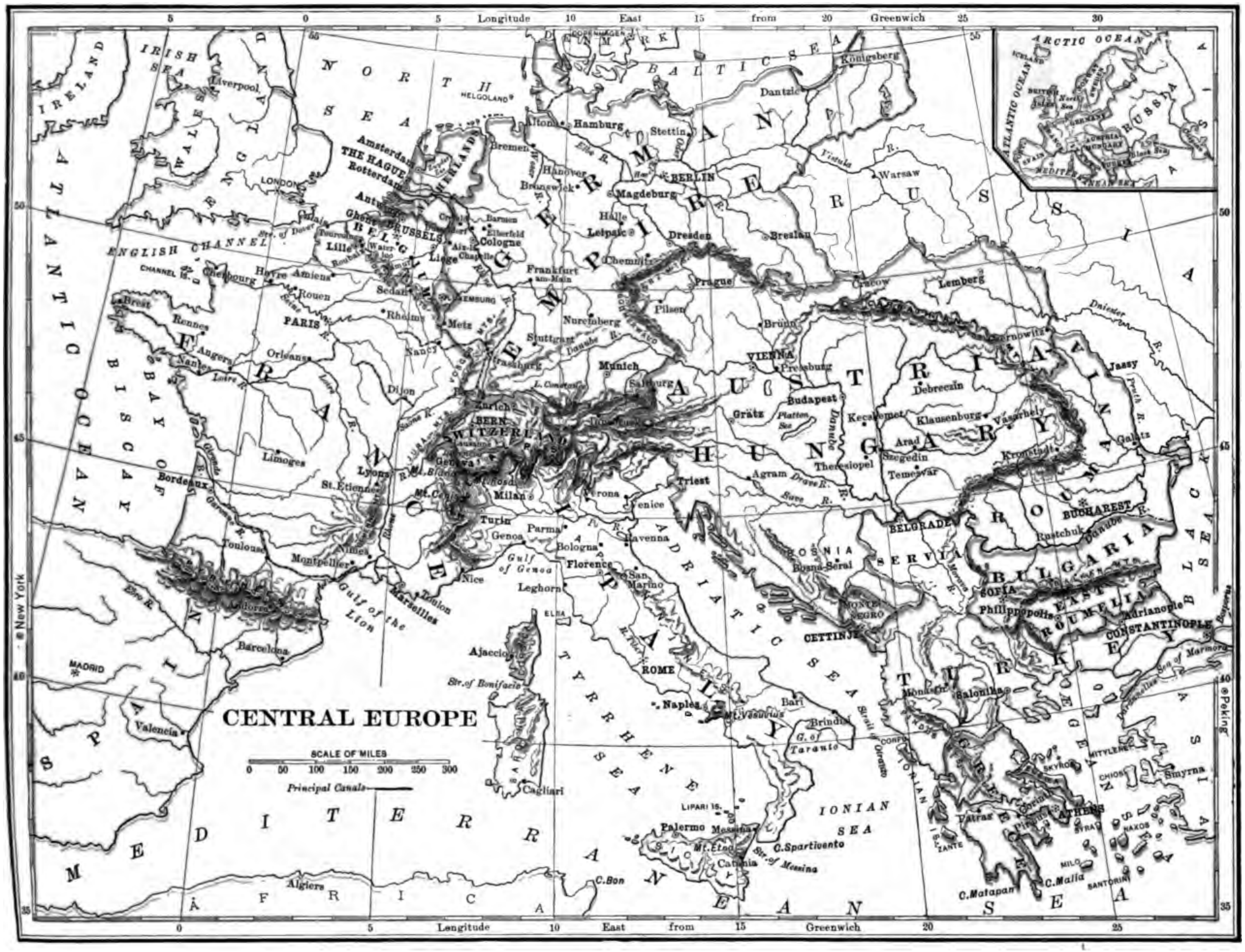
**Berlin,** the capital, is the third city in size in Europe. This city is a great trade center, and is the seat of a famous university.

**Leipsic** has a large university, and is noted for book-publishing. **Munich** and **Dresden** have great galleries of painting and sculpture. **Hamburg,** on the tide water of the Elbe, is the leading port on the mainland of Europe.

**France.** The products and the industries of France resemble those of Germany, but the former country extends southward into the belt where the mulberry tree thrives.

**Paris,** the capital, is the second largest city in the world. It is situated on the Seine river, and is noted for its art galleries and fine buildings. This city is the railroad center of France.

**Havre,** at the mouth of the Seine, is the port of Paris. Steamers from Havre reach nearly all great seaports. Among the French exports to our country are silks, woolens and millinery goods. The United States sends about the same kinds of goods to Havre as to Hamburg.



Among the articles sent from Paris to New York are leather goods, feathers, buttons, fans and jewelry.

**Lyons,** the center of the silk manufactures, is not far from the coal region of the Cevennes, nor from the silkworm district of southern France.

**Marseilles** is the largest port of this country. A canal from the Rhone river to this city makes it the chief port of the Rhone valley.

The Garonne basin produces great quantities of grapes. **Toulouse** is in the vineyard district. This city and **Bordeaux** are famous for red wines.

**Lille** is in the flax-growing region of northern France, and is near coal mines. This city has large mills for the manufacture of linen cloth and thread.

Belgium. Belgium has valuable coal mines, and is in the flax district. Laces and linen are important manufactures in this country.

Sugar beets are a leading crop in Belgium. Here are also beds of excellent sand for glass-making. The most valuable exports from this country to the United States are beet sugar, glassware, cloth and firearms.

**Antwerp,** the chief port, is the center of the railroad and canal systems which reach nearly all parts of Belgium.

**Brussels** is noted for carpets and laces. **Liege** is well known for its firearms.

The Netherlands or Holland. The people of this country are largely engaged in dairying and in raising cereals. Holland has many colonies, among which are Java, Sumatra and Dutch Guiana. These colonies send tobacco, tea, coffee, sugar and spices to Holland.

**Amsterdam** and **Rotterdam** are important ports. Many skillful diamond-cutters live in these cities. Diamonds and tobacco are the principal exports from Holland to our country.

Denmark. This country resembles Holland in its products. **Copenhagen** is the capital and principal city.

Marseilles.

Rome.

Constantinople, on the Bosporus.

### 170. Mediterranean Countries.

Spain. **Madrid,** the capital and largest city of Spain, is in the central plateau.

**Barcelona** is the chief city of eastern Spain. This city exports fruits, olive oil, silk and wine. **Valencia** is noted for its fine silk manufactures. **Malaga** is a wine and fruit port.

Portugal. **Lisbon** is the principal trade center of Portugal. This city, as well as **Oporto** farther north, has a large trade in wine and in olive oil.

Italy. The leading exports of this country are silks, wine, oil and fruits. The imports are raw cotton, sugar, coffee and other food supplies.

**Naples,** on the beautiful bay of the same name, is the largest city in Italy.

**Rome,** the capital, contains the Vatican, or residence of the Pope; and St. Peter's, the largest cathedral in the world. This city is famous for its historic ruins.

**Milan** is the most important city in the Po valley. **Genoa** is the chief port of northwest Italy. **Florence** and **Venice** have famous art galleries.

Turkey and Greece. The trade of the United States with these two countries, as well as with the other Balkan states, is very small. **Constantinople** is the capital of the Ottoman Empire, including Turkey in Europe, Turkey in Asia, Egypt and Tripoli. The chief ruler, or *sultan*, is the head of the Mohammedan religion.

**Athens,** the capital of Greece, is famous for its history, and for the ruins of its ancient temples.

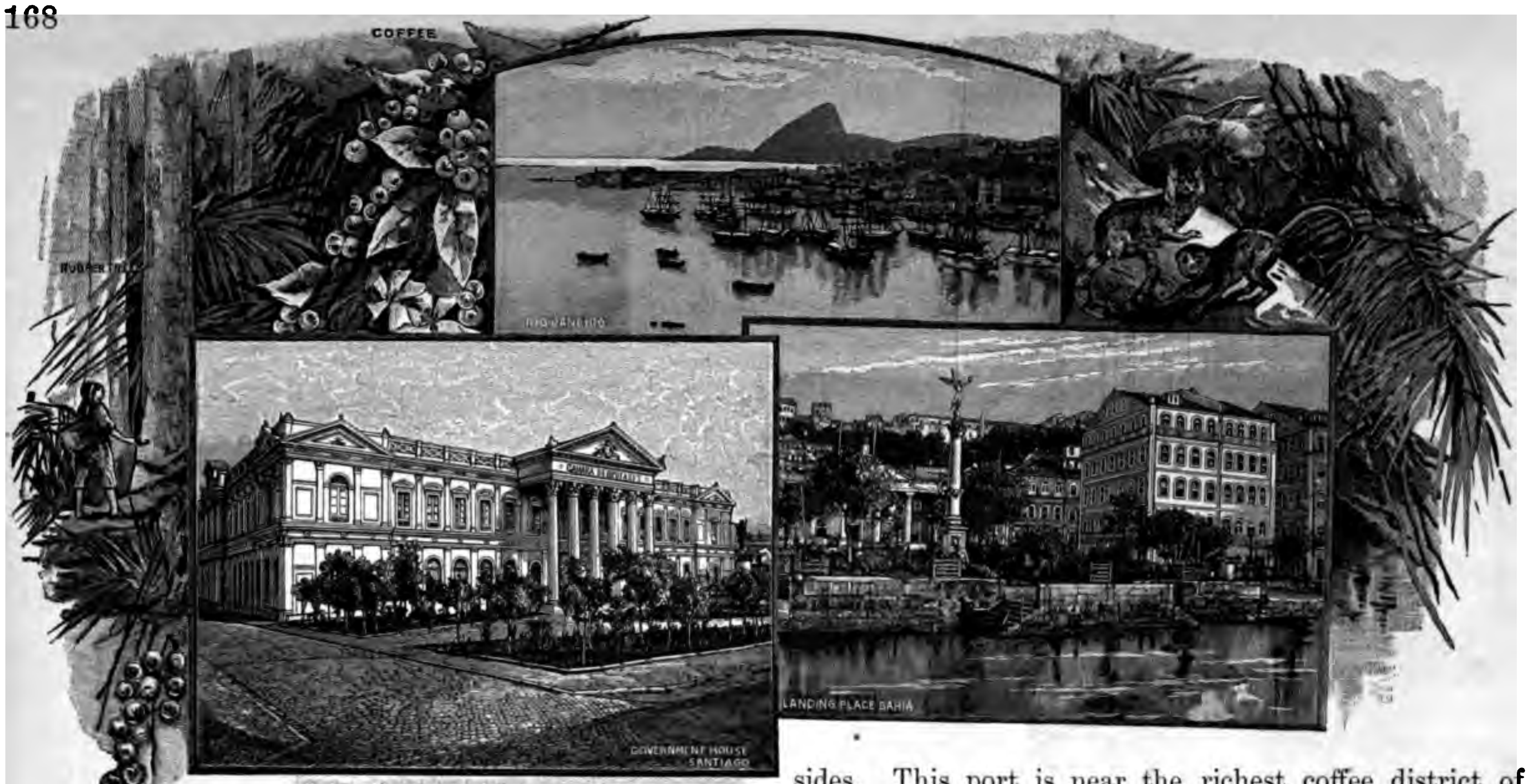
### 171. Other Countries of Europe.

Switzerland. The swift streams of this country supply good water power. Here are also mines of brown coal, or *lignite*. Raw silk is brought from Italy; cotton from our country; flax from the countries of Low Europe. Switzerland manufactures laces, silks and cotton cloth. **Zurich** is the principal manufacturing city.

**Geneva** is noted for its watches, clocks and music boxes.

Dairying and hotel-keeping are leading industries in Switzerland. Every summer thousands of tourists visit this country to see its mountains, glaciers, lakes and waterfalls.

Austria-Hungary. The fertile plain of Hungary yields grain, sugar beets and grapes. Cattle and sheep here find good pasturage. The surrounding highlands are rich in minerals. The higher slopes are forested.



# SOUTH AMERICA.

## 172. Review and Map Studies.

Describe the Andes of Chile; — of Bolivia and Peru; — of Ecuador and Colombia. *See lessons 57, 58 and 59.*

Describe the surface of Brazil; — of the Argentine Republic; — of Venezuela. *See lessons 60 to 64.*

Tell what you can about the climate and the products of the selvas; — of the llanos; — of the gran chaco and the pampas; — of the highland of Brazil.

Bound Chile. Between what two countries is Lake Titicaca? Which countries of South America are crossed by the equator? What country includes the greater part of the Orinoco basin? Between what countries is the broad La Plata mouth? Which countries of this continent do not border on Brazil? Which countries have no seacoast?

To which countries does Tierra del Fuego belong? To what empire do the Falkland islands belong? What small countries in South America belong to European nations? What is the form of government of all the countries of this continent, except the Guianas? *See lesson 103.*

## 173. Countries of South America.

Brazil. **Rio Janeiro,** the capital of this republic, is on a deep and spacious harbor,[1] sheltered by hills on all sides. This port is near the richest coffee district of Brazil, and is the largest coffee market in the world; but **Santos,** a small seaport southwest of Rio Janeiro, is a close rival.

Other exports from Rio Janeiro are sugar, hides, tobacco and diamonds.

The principal imports into Brazil are cotton cloth and machinery.

**Bahia,** a large port northeastward from Rio Janeiro, resembles the latter in its foreign trade.

**Pernambuco** is the leading sugar port of Brazil. This is one of the Brazilian ports partly inclosed by long rocky reefs. *See picture on page 58.*

**Pará** is on one of the wide distributaries of the Amazon. This city has a large rubber trade.

Other exports from the Amazon basin, mostly through Pará, are cocoa, Brazil nuts, hides and Peruvian bark.

Argentine Republic. The people of this republic are engaged chiefly in raising cattle, sheep, wheat and Indian corn.

**Buenos Ayres,** one of the principal ports of the continent, has a large foreign trade in hides, wool and wheat. The leading imports are cloth and railway materials.

**Cordova** and **La Plata** are important trade centers. The former has a university and an academy of sciences.

Uruguay. A large part of this country is grazing land for cattle and sheep. Wool and hides are the principal exports.

**Montevideo** is the capital and the largest port.

Paraguay. In this small republic the most valuable product is Paraguay tea, or *yerba maté*. **Asuncion,** the capital, is the commercial center.

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[1] This harbor was discovered in January, and was at first thought to be the wide mouth of a river; hence the name, *Rio de Janeiro*, or *Rio Janeiro*.

Chile. This republic has great mineral wealth. In the desert district of Atacama are found great quantities of niter, — a whitish salt used in the manufacture of gunpowder. Copper and silver are abundant in the northern half of Chile. Rich mines of coal are being worked in the southern half of this country.

The principal farming products of Chile are wheat and wine grapes.

**Valparaiso** is the chief port. Most of the imports, — such as cloth, cattle and sugar, — are received into this city. Large quantities of niter and copper are shipped from the northern seaport of **Iquique**.

**Santiago** is the capital and largest city of Chile. This is one of the Andean cities which are built far above the unhealthful coastal region. Santiago is in a wide valley on the western slope of the Andes, more than one third of a mile above sea level.

Bolivia. This country has rich mines of silver. Its rubber product is of the finest quality.

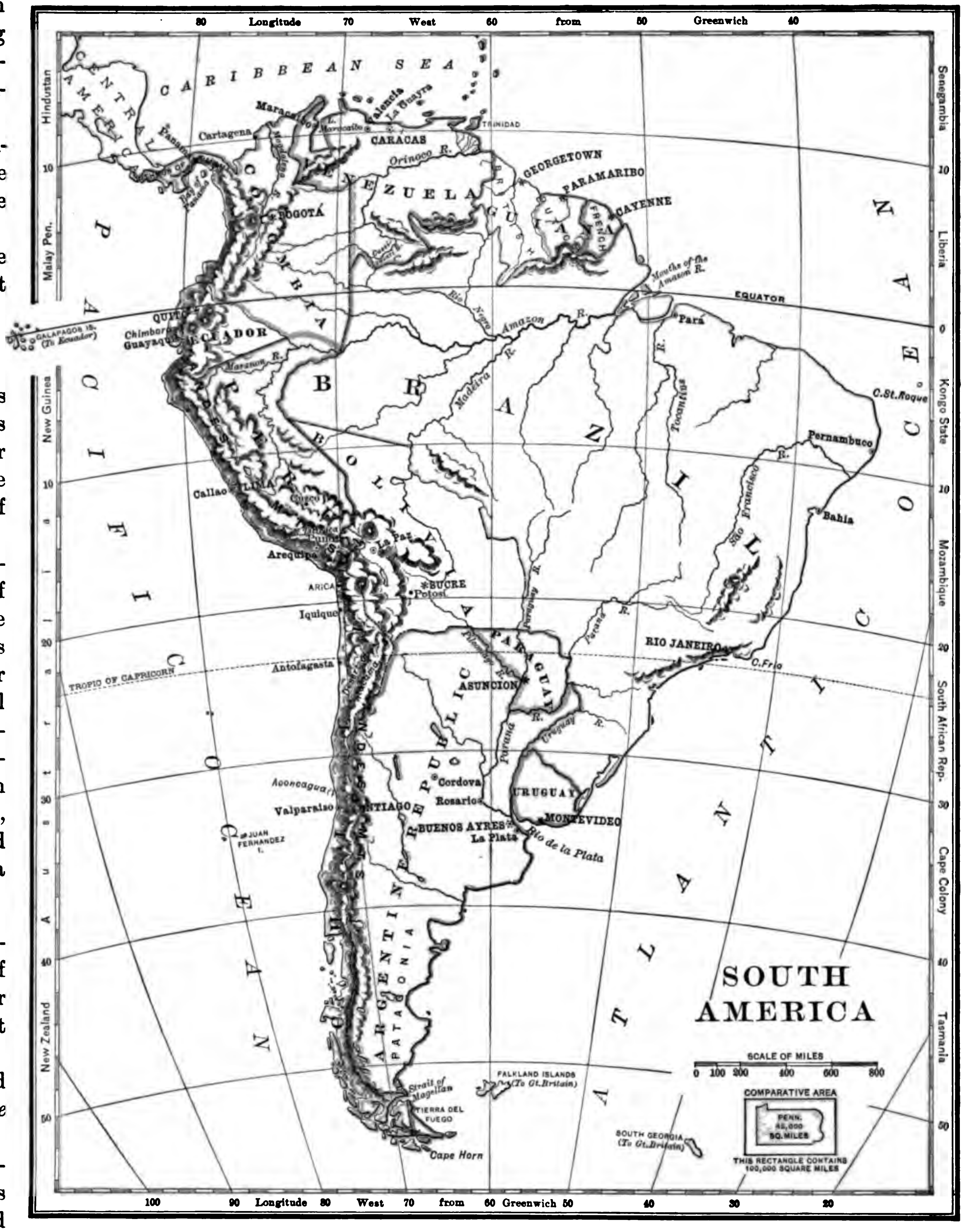
What have you read about cinchona? *See lesson 58.*

Bolivia has no seaport, but many of its products are exported through Buenos Ayres, Arica (Chile), and other ports.

**La Paz** and **Sucre** are the principal cities. **Potosi** is noted for its silver mines.

Peru. Sugar cane and cotton are raised in the flood plains of the small rivers of western Peru. Sheep and alpacas are reared in the highlands. Sugar, cotton and wool are the leading exports. Cloth is the most valuable article of import.

**Lima** is the largest city of this country. **Callao** is one of the principal seaports of western South America.



Ecuador. The staple product of Ecuador is cocoa. This country, like all the others crossed by the Andes, has rich mineral deposits.

**Quito** is the capital. **Guayaquil** is the largest city.

COLOMBIA. The leading export of this country is coffee. **Bogotá,** the capital, is over a mile and a half above sea level. **Panama,** at the Pacific end of the Panama railroad, is an important port. A large portion of the freight which passes between the Atlantic and the Pacific ports of our country goes through Panama.

VENEZUELA. Coffee is the most valuable export from Venezuela. Many hides are shipped from the Orinoco basin. **Carácas** and **Valencia** are the most important cities of this country.

GUIANA. The three colonies of Guiana are not thickly settled, and the value of their trade is not very great. Sugar is the leading export. The capitals of the colonies are the most important centers of trade.

## ASIA.

### 174. Review and Map Studies.

There are five divisions of the Chinese Empire, namely: China, Tibet, Mongolia, Eastern Turkestan and Manchuria. Describe the surface, the climate and the products of each. *See lessons 72, 69 and 68.*

In like manner describe India (*see lesson 73*); — Siberia (*see lesson 71*); — Japan (*see lesson 74*); — Persia, Turkey and Arabia (*see lesson 70*); — Java, Sumatra and the Philippine islands (*see lesson 74*).

What country is on the north of the Chinese Empire? Where are Anam and Siam? What countries border on the Arabian sea? — On the Persian Gulf? — On the Caspian sea? What two countries are between India and Persia?

### 175. Countries of Asia.

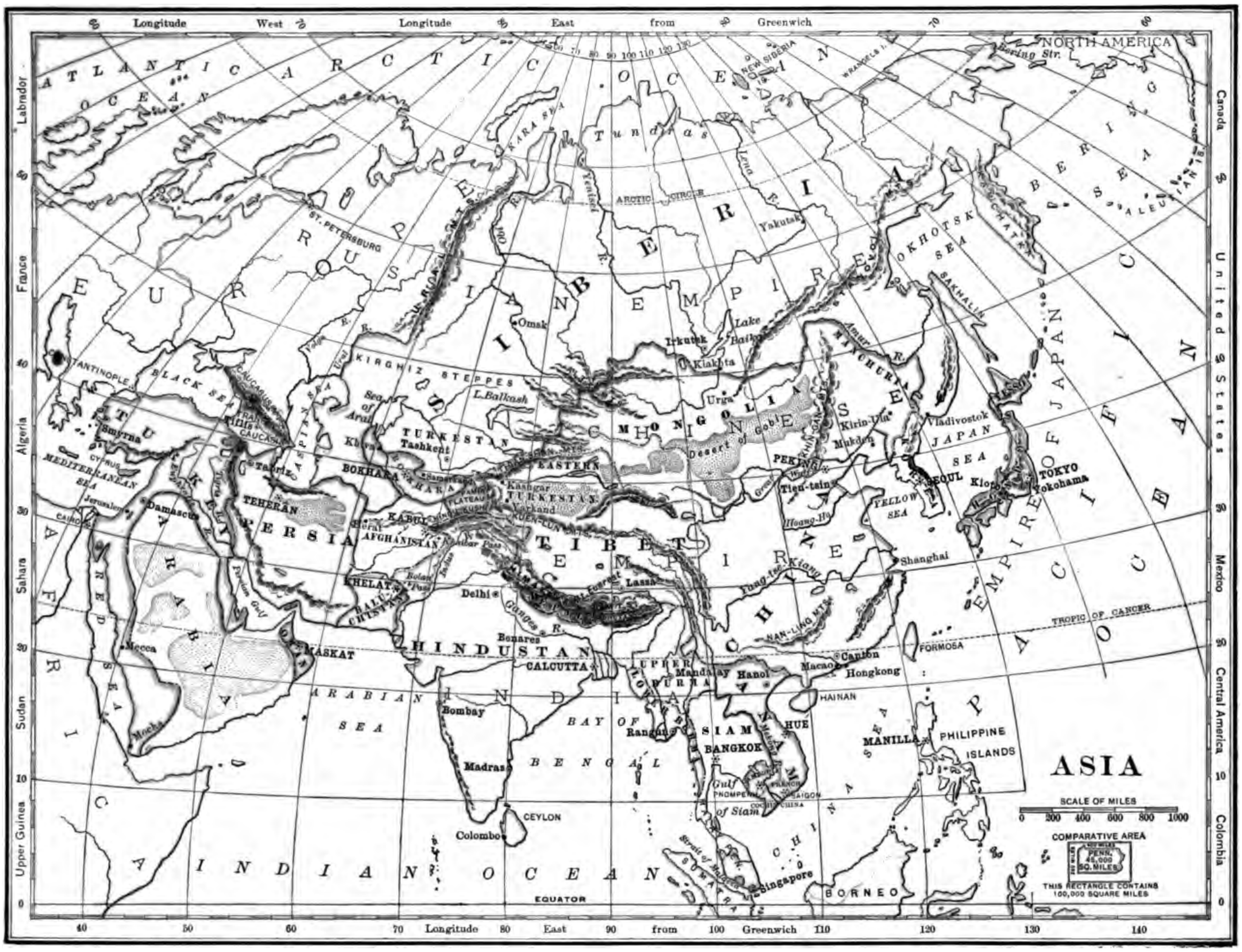
INDIA. This country trades chiefly with Great Britain and with China. The most valuable exports from India are cotton and cotton seed, wheat, rice, opium, jute, tea and indigo. The principal imports are cotton cloth and hardware.

**Bombay** and **Calcutta** are the greatest seaports of India. Each is about as large as the city of Brooklyn.

Calcutta, the capital of India, is on the Hugli river, in the Ganges delta. This city is the principal shipping-point for the produce of the Ganges and the Brahmaputra basins. Railroads, rivers and canals form the inland highways of trade to and from this great port. No large rivers carry products to Bombay, but the city is reached by railroads from nearly all parts of India. This port owes its rapid growth largely to its situation on the west coast, much nearer than Calcutta to the Suez canal and the British Isles.

**Madras** is the largest seaport of southern India.

**Benares** is the chief seat of the Hindu religion, and is one of the oldest cities in the world. In this holy city of the Hindus, the north bank of the Ganges is lined with great temples.



**Rangun** is the chief port of Burmese India. This city has a large trade in rice.

**Delhi** and **Mandalay** are large centers of trade in India. *See picture of old Delhi, page 68.*

Locate Colombo and Singapore. What have you learned about the latter city? *See lesson 144.* Ceylon and the Straits Settlements, as well as India, are British possessions.[1]

FRENCH INDO-CHINA. French Indo-China includes Anam, Cochin-China, Cambodia and other provinces. All these are under the control of France.

The products of French Indo-China are similar to those of British India. **Hanoi, Hué, Saïgon** and **Pnompenh** are the chief centers of trade.

SIAM. This country is ruled by a native king, — an absolute monarch. The resources of the country are poorly developed. Teak and rice are the principal products. **Bangkok** is the chief city.

EAST INDIES. Sumatra, Java, Celebes, and middle and southern Borneo are possessions of Holland. They are called the *Dutch East Indies.* Northwest Borneo is under the control of the British nation. Spain controls the Philippine islands.

What have you learned about the islands named above? Locate Manilla, Batavia and Macassar. *See map on page 175.*

CHINA. The British nation controls the greater part of China's foreign trade, though the United States has a small share in it. The island of Hongkong, on the coast of China, is a British colony. It exports Chinese tea and silk; and imports opium, cotton cloth, sugar and flour for the great empire near by.

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[1] France and Portugal control a few small colonies in the southern and western parts of the Deccan.

The United States imports tea and silk from China,—chiefly from the ports of **Shanghai, Canton** and **Fuchau.**

**Peking,** the capital, and Canton are the largest cities of the Chinese Empire. **Yarkand** is in the principal oasis of the province of Eastern Turkestan. **Lassa** is the chief city of Tibet.

JAPAN. Japan is the only limited monarchy in Asia, having its own ruler. All the other independent countries are absolute monarchies.

The exports of Japan are taken from its rice swamps, its silkworm nurseries and its tea farms. The imports are mostly cloth, metal goods and petroleum. Japanese trade is carried on chiefly with the United States and with Great Britain.

Cairo, Egypt.

**Japan is the most progressive of Asiatic countries. The Japanese have good schools, railway and telegraph lines, and large manufactories. Among the latter are iron foundries, glass-works, paper mills, cotton and silk mills. The people of Japan are noted for the weaving of silk and the carving of ivory.**

**Tokyo** is the capital and the commercial center of Japan. Only two cities in America are larger than Tokyo.

**Yokohama,** on the bay of Tokyo, is the chief seaport. **Osaka** is an important manufacturing city. **Kioto** is surrounded by a great number of Buddhist temples.

KOREA. The Japanese have recently won for Korea its freedom from Chinese authority. The foreign trade of this country is small, and is mostly in the hands of the Japanese. **Seoul** is the chief city of Korea.

**By the terms of the China-Japanese treaty of 1895, Korea was made an independent kingdom,—an absolute monarchy.**

RUSSIA IN ASIA. Siberia and Trans-Caucasia[1] are parts of the great Russian Empire, which comprises about one seventh of the land-surface of the earth. Bokhara and Khiva also are under the control of Russia.

**Tashkent,** the largest city in Asiatic Russia, is in a district made fertile by irrigation. **Tiflis** is a city through which Russia conducts a large part of its trade with Persia and other countries of southwest Asia. The railroad which carries great quantities of petroleum from **Baku** to the port of **Batum** passes through Tiflis.

**Irkutsk** and **Vladivostok** are centers of Siberian trade. The latter city is the Pacific port of Siberia, and the terminus of the Siberian railroad now being built. *See map of Asia in the Supplement.*

Alexandria.

PERSIA. Cereals and the opium-poppy grow in the fertile portions of Persia, chiefly in the districts near the Caspian sea. Many sheep are reared in the highland regions. Dates thrive along the coast, and pearls are obtained from the border waters on the south. The Persians are famous for their handmade carpets and rugs.

**Teherân** and **Tabriz** are the principal cities.

AFGHANISTAN. This country is crossed by the caravan routes that lead into India. **Kabul** is the chief city.

BALUCHISTAN. The people of this rugged country are mostly shepherds. **Khelât** is the largest city.

ASIATIC TURKEY. The products of this country are similar to those of Persia, but the Red sea coast is famous for its coffee. **Mocha** is the chief port for the shipment of this coffee. Mohammed was born in **Mecca.**

**Smyrna** is the largest city and port of Asiatic Turkey. **Damascus** has an extensive caravan trade with the Arabs.

**Jerusalem** is famous for its religious history.

ARABIA. Arabia, like Persia and Turkey, is a Mohammedan country. *See lesson 71.*

OMAN. **Maskat** exports dates, and imports rice.

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[1] **Trans-Caucasia is the name of the Asiatic portion of the large Russian province of Caucasus, lying on both sides of the Caucasus mountains.**

### 176. Review and Map Studies.

Describe the Nile basin. *See lesson 88.* What part of this basin is in Egypt?—In Nubia? What European nation claims the region about the highland of Abyssinia?

Where is Tripoli? Where is Morocco? Describe the Sahara. *See lesson 89.* In what respect does the Sudan differ from the Sahara? *See lesson 90.*

Locate Liberia and Sierra Leone. What nation claims the region stretching northeastward from Liberia to the Mediterranean sea?

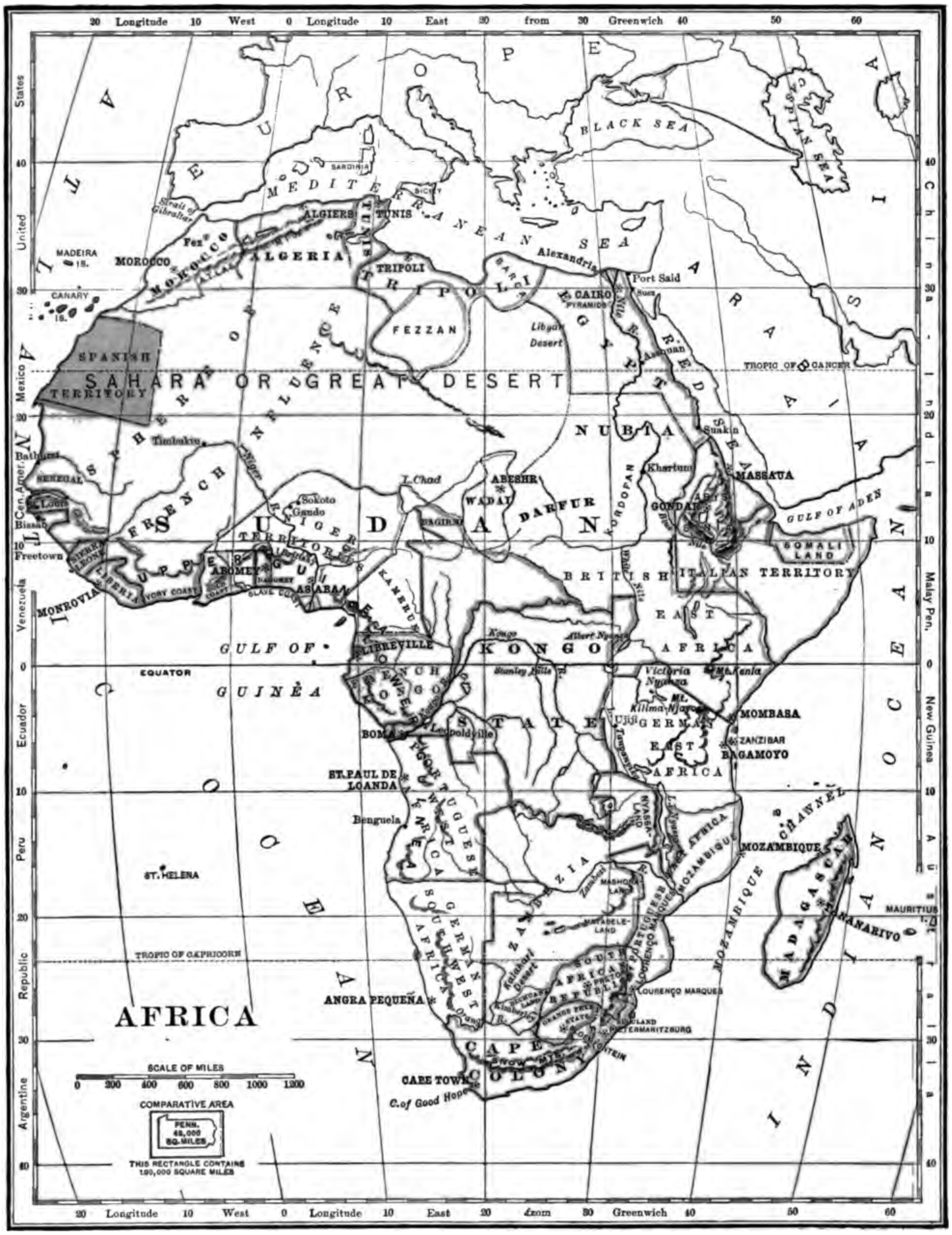
What state or country comprises the greater part of the Kongo basin? Between what two European claims is Lake Victoria? What lake partly separates Kongo State from German East Africa? Where is the territory known as the French Kongo?

What European nation claims a broad coastal belt on both sides of the lower Zambezi? What name is given to the middle region of the Zambezi basin? What European nation controls Zambezia and Cape Colony? *See lesson 92.*

Describe the surface and the products of Cape Colony. Locate the Orange Free State. What country is on the north of the Free State?

What have you learned about Madagascar? *See lesson 92.* Locate the Madeira, the Canary and the Mauritius islands. For what is St. Helena noted? *See lesson 84.*

Locate Zanzibar, Tananarivo, Mozambique.

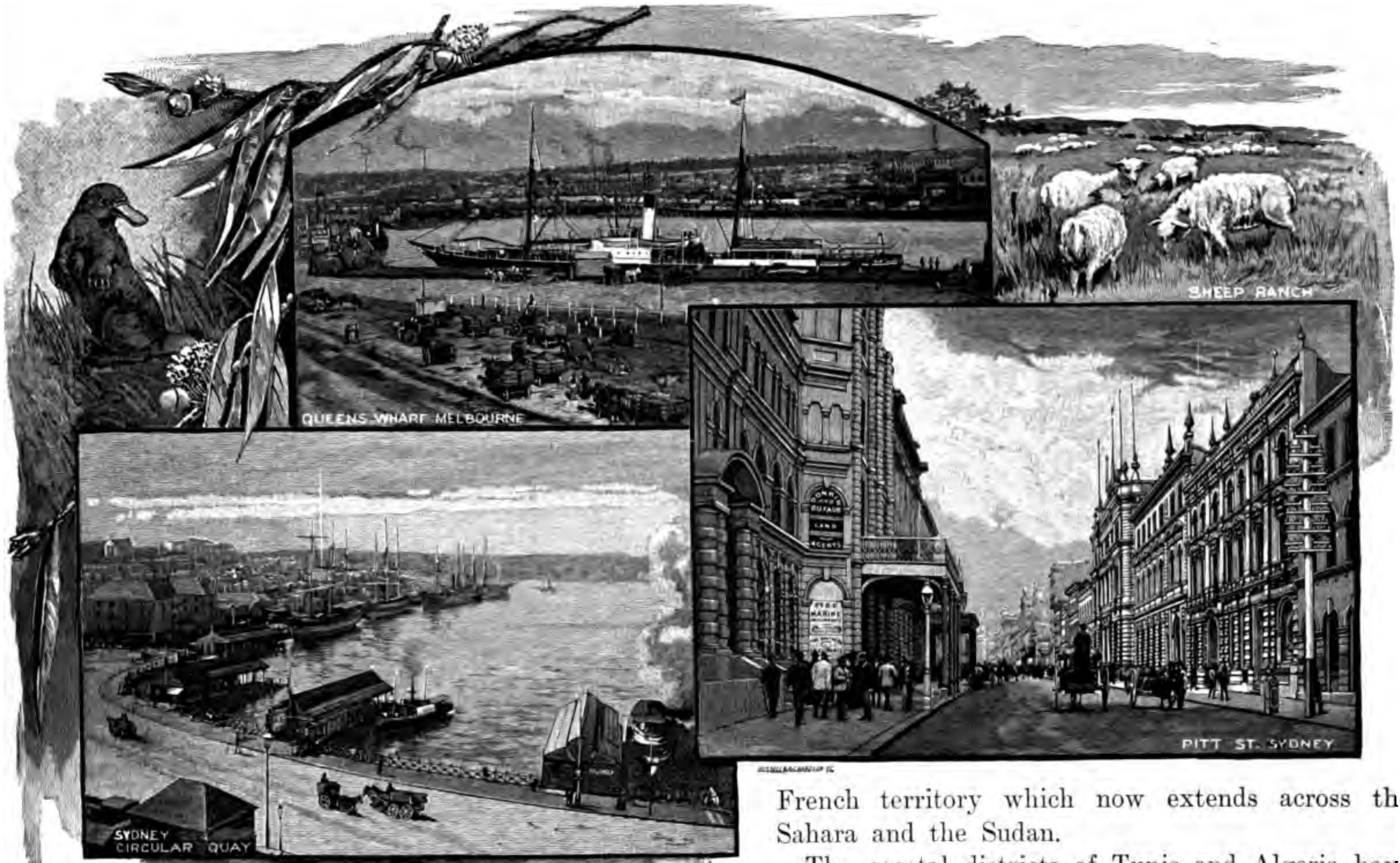


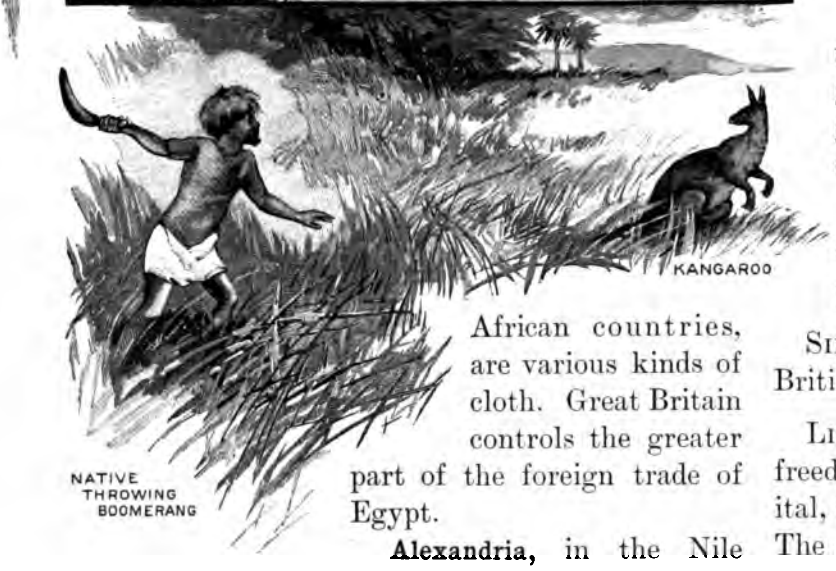
### 177. Countries of Africa.

EGYPT. This country is nominally part of the Ottoman Empire, though the Sultan of Turkey has very little control over the affairs of Egypt. The *Khedive*, or ruler, of Egypt resides in **Cairo**, the capital. This is one of the oldest cities in the world.

What have you learned about Cairo? *See page 90.* Compare the location of this city with that of New Orleans. Which is farther from the equator?

The principal exports of Egypt are cotton and cotton seed. The most valuable imports here, as in all other





African countries, are various kinds of cloth. Great Britain controls the greater part of the foreign trade of Egypt.

**Alexandria,** in the Nile delta, is the largest seaport of this country.

Before the discovery of the route from Europe to India by way of the cape of Good Hope, Alexandria was one of the greatest ports in the world. When the East India trade with western Europe was turned away from the Mediterranean sea, the port in the Nile delta rapidly declined. The building of the Suez canal has greatly increased the trade of Alexandria.

TRIPOLI. This portion of the Ottoman Empire is thinly settled. The population of the entire country of Tripoli is smaller than that of Brooklyn. The capital is the only important city.

TUNIS AND ALGERIA. These countries have been added to the possessions of France. They form part of the French territory which now extends across the Sahara and the Sudan.

The coastal districts of Tunis and Algeria have many fertile valleys that produce wheat. Olives grow here in abundance, and cattle and sheep find good grazing land. The cities of **Tunis** and **Algiers** export wheat, olive oil, wool and hides to France.

MOROCCO. The products of this country are similar to those of Algeria. **Fez** and **Morocco** are the principal cities of Morocco.

SIERRA LEONE. This small colony belongs to the British nation. **Freetown** exports palm oil.

LIBERIA. This is a negro republic settled largely by freed slaves from the United States. **Monrovia,** the capital, is named after a former President of our country. The chief exports from Monrovia are coffee and palm oil.

KONGO STATE. The King of Belgium is the ruler of the Kongo State. **Boma** is the local capital.

The most valuable exports of the Kongo State are coffee, rubber, ivory and palm oil.

CAPE COLONY. Cape Colony is a large and valuable British possession. *See lesson 92.*

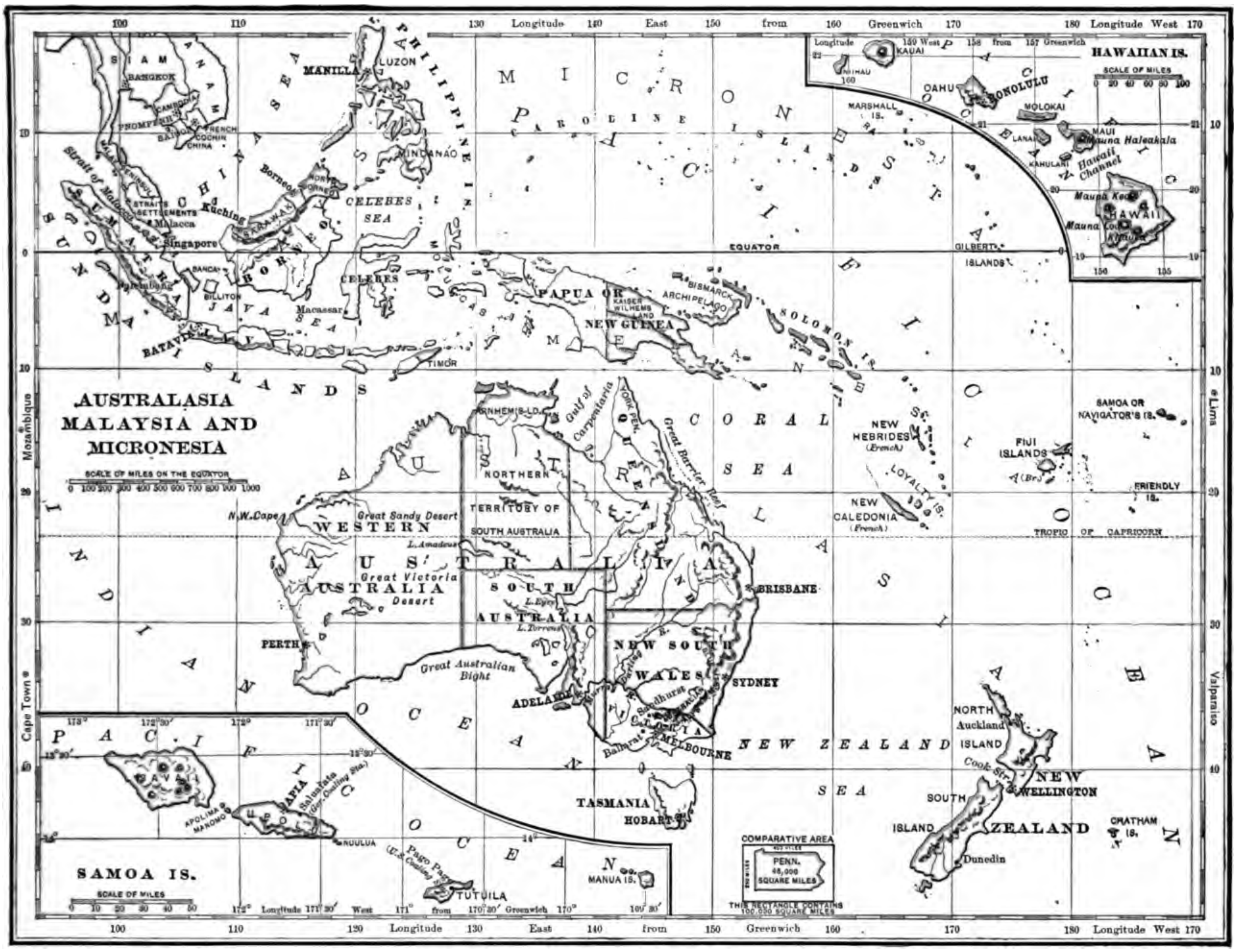
European nations have seized nearly all parts of Africa. Italy is trying to control the territory in the region of the highland of Abyssinia; France not only claims large areas on the mainland, but is also seeking to control Madagascar; Great Britain, Germany and Portugal possess the greater portion of middle and southern Africa. Spain has a footing in the Sahara, and also directs the affairs of the Canary islands.

### 178. Review and Map Studies.

**Describe the surface of Australia. Tell what you can about its climate.** *See maps on pages 21 and 24; also lesson 93.*

**In what part of Australia is the colony of Victoria? Where is Queensland? What colony is between Victoria and Queensland?**

**Which colony occupies a broad belt stretching north and south across this continent? What name is given to the most westerly colony in Australia? Locate Tasmania.**



Tell what you have learned about New Zealand; — Papua; — the Fiji islands; — the Friendly islands; — the Samoa islands; — Micronesia; — the Hawaiian islands. *See lesson 95.*

### 179. Colonies of Australia.

The colonies in the southeastern part of this continent are the most thriving. Here are vast grazing districts that support millions of sheep and cattle. Large areas are planted with wheat, Indian corn and other cereals. Great quantities of gold and tin are mined. Middle and western Australia are thinly settled.

The principal exports from Australia are wool, gold and cereals. The most valuable imports are cloth and iron manufactures. The largest seaports are in southeast Australia, in the productive colonies.

**Melbourne,** the chief seaport of Victoria, is the largest city of Australia. Its population is greater than that of Boston. Melbourne has extensive manufactures.

**Sydney,** the principal port of New South Wales, is on a long and deep landlocked bay. This is the oldest and the second largest city in Australia.

**Adelaide** is the commercial center of South Australia. **Brisbane,** on the river of the same name, is the capital and leading port of Queensland. **Hobart** is an important port of Tasmania.

New Zealand. The most valuable exports from New Zealand are wool, gold and frozen meat. **Dunedin** is the chief port of the South island; **Auckland,** of the North island. **Wellington** is the capital.

# SUPPLEMENT.

## AREA AND POPULATION OF PRINCIPAL COUNTRIES AND COLONIES.

### NORTH AMERICA.

| Year. | | Sq. Miles. | Population. |
|---|---|---|---|
| 1893 | Balize | 7,500 | 31,300 |
| 1891 | Canada | 3,450,000 | 4,833,000 |
| 1892 | Costa Rica | 23,000 | 243,000 |
| 1894 | Cuba | 43,000 | 1,632,000 |
| 1893 | Guatemala | 47,000 | 1,460,000 |
| 1894 | Haiti | 28,000 | 1,580,000 |
| 1889 | Honduras | 43,000 | 396,000 |
| 1893 | Mexico | 767,000 | 12,000,000 |
| 1891 | Newfoundland | 42,000 | 202,000 |
| 1892 | Nicaragua | 49,500 | 315,000 |
| 1892 | Salvador | 7,200 | 780,000 |
| 1890 | United States | 3,556,290 | 63,006,000 |

### SOUTH AMERICA.

| Year. | | Sq. Miles. | Population. |
|---|---|---|---|
| 1893 | Argentine Republic | 1,125,000 | 4,260,000 |
| 1895 | Brazil | 3,210,000 | 16,000,000 |
| 1891 | British Guiana | 110,000 | 285,000 |
| 1894 | Bolivia | 567,000 | 2,300,000 |
| 1893 | Chile | 294,000 | 3,365,000 |
| 1892 | Colombia | 514,000 | 4,800,000 |
| 1892 | Dutch Guiana | 46,000 | 72,000 |
| 1890 | Ecuador | 120,000 | 1,275,000 |
| 1891 | French Guiana | 47,000 | 25,000 |
| 1893 | Paraguay | 98,000 | 480,000 |
| 1894 | Peru | 464,000 | 3,000,000 |
| 1894 | Uruguay | 72,000 | 787,000 |
| 1891 | Venezuela | 594,000 | 2,324,000 |

### EUROPE.

| Year. | | Sq. Miles. | Population. |
|---|---|---|---|
| 1890 | Austria-Hungary | 241,000 | 41,330,000 |
| 1893 | Belgium | 11,400 | 6,260,000 |
| 1893 | Bulgaria | 38,000 | 3,310,000 |
| 1890 | Denmark | 15,300 | 2,185,000 |
| 1891 | England | 50,800 | 27,484,000 |
| 1891 | France | 204,000 | 38,343,000 |
| 1890 | Germany | 208,700 | 49,428,000 |
| 1889 | Greece | 25,000 | 2,187,000 |
| 1891 | Ireland | 32,600 | 4,706,000 |
| 1894 | Italy | 110,000 | 30,725,000 |
| 1894 | Montenegro | 3,600 | 200,000 |
| 1893 | Netherlands | 12,600 | 4,733,000 |
| 1891 | Norway | 125,000 | 2,000,000 |
| 1894 | Portugal | 34,000 | 5,300,000 |
| 1893 | Roumania | 48,300 | 5,800,000 |
| 1893 | Russia | 2,100,000 | 98,840,000 |
| 1891 | Scotland | 30,400 | 4,026,000 |
| 1894 | Servia | 19,000 | 2,256,000 |
| 1895 | Spain | 198,000 | 18,000,000 |
| 1893 | Sweden | 173,000 | 4,825,000 |
| 1894 | Switzerland | 16,000 | 2,990,000 |
| 1895 | European Turkey | 61,000 | 4,780,000 |
| 1891 | Wales | 7,400 | 1,519,000 |

### ASIA.

| Year. | | Sq. Miles. | Population. |
|---|---|---|---|
| 1895 | Afghanistan | 212,000 | 4,000,000 |
| 1895 | Arabia | 1,000,000 | 2,200,000 |
| 1895 | Asiatic Turkey | 687,000 | 21,600,000 |
| 1895 | Baluchistan | 130,000 | 500,000 |
| 1895 | Borneo | 290,000 | 1,750,000 |
| 1892 | Celebes | 71,000 | 2,000,000 |
| 1895 | Chinese Empire | 4,218,000 | 400,000,000 |
| 1891 | India (British) | 1,560,000 | 300,000,000 |
| 1895 | Indo-China (French) | 138,000 | 17,000,000 |
| 1892 | Java | 51,000 | 24,000,000 |
| 1892 | Japan | 148,000 | 40,089,000 |
| 1895 | Korea | 82,000 | 10,000,000 |
| 1895 | Nepal | 54,000 | 2,000,000 |
| 1895 | Persia | 628,000 | 9,000,000 |
| 1895 | Philippines | 114,000 | 7,000,000 |
| 1893 | Russia in Asia | 6,560,000 | 18,125,000 |
| 1895 | Siam | 300,000 | 5,000,000 |
| 1895 | Sumatra | 161,000 | 3,000,000 |

### AFRICA.

| Year. | | Sq. Miles. | Population. |
|---|---|---|---|
| 1895 | Abyssinia | 194,000 | 4,500,000 |
| 1891 | Algeria | 185,000 | 4,125,000 |
| 1895 | Cape Colony | 221,000 | 1,825,000 |
| 1895 | Egypt | 400,000 | 6,820,000 |
| 1895 | Kongo State | 900,000 | 15,000,000 |
| 1894 | Liberia | 14,400 | 1,068,000 |
| 1895 | Madagascar | 228,500 | 3,500,000 |
| 1895 | Morocco | 220,000 | 5,000,000 |
| 1895 | Orange Free State | 48,000 | 208,000 |
| 1895 | Sahara | 2,000,000 | 2,500,000 |
| 1895 | South African Republic | 119,000 | 500,000 |
| 1895 | Sudan | 2,000,000 | 50,000,000 |
| 1895 | Tripoli | 340,000 | 800,000 |
| 1895 | Tunis | 45,000 | 1,500,000 |

### OCEANIA.

| Year. | | Sq. Miles. | Population. |
|---|---|---|---|
| 1890 | Hawaiian Islands | 6,500 | 90,000 |
| 1895 | New Guiana | 311,000 | 800,000 |
| 1891 | New South Wales | 310,700 | 1,132,000 |
| 1891 | New Zealand | 104,500 | 627,000 |
| 1891 | Queensland | 668,500 | 394,000 |
| 1891 | South Australia | 904,000 | 320,000 |
| 1891 | Tasmania | 26,000 | 147,000 |
| 1891 | Victoria | 88,000 | 1,140,000 |
| 1891 | West Australia | 1,060,000 | 53,000 |

## POPULATION OF THE PRINCIPAL CITIES OF THE WORLD.

### NORTH AMERICA.

*British America.*

| Year. | | Population. |
|---|---|---|
| 1891 | Montreal | 217,000 |
| 1891 | Toronto | 181,000 |
| 1891 | Quebec | 63,000 |
| 1891 | Hamilton | 49,000 |
| 1891 | Ottawa | 44,000 |
| 1891 | St. John | 39,000 |
| 1891 | Halifax | 39,000 |
| 1891 | London | 32,000 |
| 1891 | St. John's | 29,000 |
| 1891 | Winnipeg | 26,000 |
| 1891 | Victoria | 17,000 |

*Central America.*

| Year. | | Population. |
|---|---|---|
| 1893 | Guatemala | 71,000 |
| 1895 | Leon | 25,000 |
| 1893 | San Salvador | 20,000 |
| 1892 | San José | 19,000 |
| 1895 | Managua | 18,000 |

*Mexico.*

| Year. | | Population. |
|---|---|---|
| 1893 | Mexico | 330,000 |
| 1893 | Guadalajara | 95,000 |

*United States.*

See page 181.

*West Indies.*

| Year. | | Population. |
|---|---|---|
| 1892 | Havana | 225,000 |
| 1892 | Santiago | 71,000 |
| 1894 | Port au Prince | 50,000 |
| 1893 | Kingston | 47,000 |
| 1892 | Mantanzas | 27,000 |
| 1892 | Cienfuegos | 27,000 |

### SOUTH AMERICA.

*Argentine Republic.*

| Year. | | Population. |
|---|---|---|
| 1894 | Buenos Ayres | 580,000 |
| 1894 | Córdova | 67,000 |
| 1894 | La Plata | 65,000 |

*Bolivia.*

| Year. | | Population. |
|---|---|---|
| 1895 | La Paz | 56,000 |
| 1894 | Sucre | 24,000 |

*Brazil.*

| Year. | | Population. |
|---|---|---|
| 1892 | Rio Janeiro | 800,000 |
| 1890 | Penambuco | 190,000 |
| 1890 | Bahia | 80,000 |
| 1890 | Pará | 65,000 |

*Chile.*

| Year. | | Population. |
|---|---|---|
| 1890 | Santiago | 250,000 |
| 1890 | Valparaiso | 150,000 |

*Colombia.*

| Year. | | Population. |
|---|---|---|
| 1886 | Bogotá | 120,000 |
| 1886 | Panama | 25,000 |

*Ecuador.*

| Year. | | Population. |
|---|---|---|
| 1894 | Quito | 80,000 |
| 1894 | Guayaquil | 45,000 |

*Guiana.*

| Year. | | Population. |
|---|---|---|
| 1891 | Georgetown | 53,000 |
| 1892 | Paramaribo | 29,000 |
| 1895 | Cayenne | 11,000 |

*Paraguay.*

| Year. | | Population. |
|---|---|---|
| 1894 | Asuncion | 26,000 |

*Peru.*

| Year. | | Population. |
|---|---|---|
| 1894 | Lima | 162,000 |
| 1895 | Callao | 38,000 |
| 1895 | Arequipa | 32,000 |
| 1895 | Cuzco | 19,000 |

*Uruguay.*

| Year. | | Population. |
|---|---|---|
| 1893 | Montevideo | 226,000 |

*Venezuela.*

| Year. | | Population. |
|---|---|---|
| 1891 | Carácas | 73,000 |
| 1891 | Valencia | 39,000 |
| 1891 | Maracaibo | 34,000 |

### EUROPE.

*Austria-Hungary.*

| Year. | | Population. |
|---|---|---|
| 1890 | Vienna | 1,364,000 |
| 1890 | Budapest | 506,000 |
| 1890 | Prague | 184,000 |
| 1890 | Trieste | 158,000 |

*Belgium.*

| Year. | | Population. |
|---|---|---|
| 1893 | Brussels | 498,000 |
| 1893 | Antwerp | 247,000 |
| 1893 | Liége | 159,000 |
| 1893 | Ghent | 153,000 |

*Balkan States.*

| Year. | | Population. |
|---|---|---|
| 1895 | Constantinople | 900,000 |
| 1890 | Bucharest | 195,000 |
| 1895 | Salonica | 150,000 |
| 1889 | Athens | 107,000 |
| 1893 | Sofia | 47,000 |

*Denmark.*

| Year. | | Population. |
|---|---|---|
| 1890 | Copenhagen | 375,000 |

*England and Wales.*

| Year. | | Population. |
|---|---|---|
| 1894 | London | 4,349,000 |
| 1894 | Manchester | 520,000 |
| 1894 | Liverpool | 507,000 |
| 1894 | Birmingham | 492,000 |
| 1894 | Leeds | 389,000 |
| 1894 | Sheffield | 338,000 |
| 1894 | Bristol | 227,000 |
| 1894 | Bradford | 224,000 |
| 1894 | Cardiff | 149,000 |

*France.*

| Year. | | Population. |
|---|---|---|
| 1891 | Paris | 2,448,000 |
| 1891 | Lyons | 416,000 |
| 1891 | Marseilles | 404,000 |
| 1891 | Bordeaux | 252,000 |
| 1891 | Lille | 201,000 |
| 1891 | Toulouse | 150,000 |
| 1891 | Havre | 116,000 |

*Germany.*

| Year. | | Population. |
|---|---|---|
| 1890 | Berlin | 1,579,000 |
| 1890 | Munich | 349,000 |
| 1890 | Breslau | 335,000 |
| 1890 | Hamburg | 323,000 |
| 1890 | Leipsic | 295,000 |
| 1890 | Cologne | 282,000 |
| 1890 | Dresden | 277,000 |

*Ireland.*

| Year. | | Population. |
|---|---|---|
| 1891 | Belfast | 256,000 |
| 1891 | Dublin | 245,000 |
| 1891 | Cork | 75,000 |
| 1891 | Limerick | 37,000 |

*Italy.*

| Year. | | Population. |
|---|---|---|
| 1893 | Naples | 523,000 |
| 1893 | Rome | 451,000 |
| 1893 | Milan | 432,000 |
| 1893 | Turin | 335,000 |
| 1893 | Palermo | 276,000 |
| 1893 | Genoa | 215,000 |
| 1893 | Florence | 200,000 |
| 1893 | Venice | 150,000 |

*Netherlands.*

| Year. | | Population. |
|---|---|---|
| 1893 | Amsterdam | 447,000 |
| 1893 | Rotterdam | 229,000 |
| 1893 | The Hague | 175,000 |

*Norway and Sweden.*

| Year. | | Population. |
|---|---|---|
| 1893 | Stockholm | 257,000 |
| 1891 | Christiania | 151,000 |
| 1893 | Gothenburg | 109,000 |
| 1891 | Bergen | 54,000 |

*Portugal.*

| Year. | | Population. |
|---|---|---|
| 1895 | Lisbon | 275,000 |
| 1895 | Oporto | 112,000 |

*Russia.*

| Year. | | Population. |
|---|---|---|
| 1891 | St. Petersburg | 1,035,000 |
| 1891 | Moscow | 822,000 |
| 1891 | Warsaw | 523,000 |
| 1891 | Odessa | 333,000 |
| 1891 | Riga | 182,000 |

*Scotland.*

| Year. | | Population. |
|---|---|---|
| 1894 | Glasgow | 687,000 |
| 1894 | Edinburgh | 271,000 |
| 1894 | Dundee | 159,000 |

*Spain.*

| Year. | | Population. |
|---|---|---|
| 1895 | Madrid | 484,000 |
| 1895 | Barcelona | 280,000 |
| 1895 | Valencia | 175,000 |
| 1895 | Málaga | 138,000 |

*Switzerland.*

| Year. | | Population. |
|---|---|---|
| 1893 | Zurich | 103,000 |
| 1893 | Geneva | 79,000 |
| 1893 | Basel | 75,000 |
| 1893 | Bern | 48,000 |

### ASIA.

*Asiatic Russia.*

| Year. | | Population. |
|---|---|---|
| 1892 | Tashkent | 156,000 |
| 1892 | Tiflis | 147,000 |
| 1893 | Baku | 112,000 |
| 1892 | Irkutsk | 51,000 |

*China.*

| Year. | | Population. |
|---|---|---|
| 1893 | Canton | 1,800,000 |
| 1893 | Peking | 1,000,000 |
| 1893 | Tien-tsin | 950,000 |
| 1893 | Hankow | 800,000 |
| 1893 | Fuchau | 640,000 |
| 1893 | Shanghai | 400,000 |

*British India.*

| Year. | | Population. |
|---|---|---|
| 1891 | Calcutta | 862,000 |
| 1891 | Bombay | 822,000 |
| 1891 | Madras | 453,000 |
| 1891 | Hyderabad | 415,000 |
| 1891 | Lucknow | 273,000 |
| 1891 | Benares | 219,000 |
| 1891 | Delhi | 193,000 |
| 1891 | Mandalay | 189,000 |
| 1891 | Rangun | 180,000 |
| 1891 | Singapore | 145,000 |

*French Indo-China.*

| Year. | | Population. |
|---|---|---|
| 1895 | Hanoi | 150,000 |
| 1895 | Hué | 150,000 |
| 1895 | Saigon | 85,000 |

*East India Islands.*

| Year. | | Population. |
|---|---|---|
| 1894 | Manilla | 290,000 |
| 1894 | Soerabaya | 140,000 |
| 1894 | Batavia | 110,000 |

*Japan.*

| Year. | | Population. |
|---|---|---|
| 1892 | Tokyo | 1,180,000 |
| 1892 | Osaka | 480,000 |
| 1892 | Kioto | 308,000 |
| 1892 | Yokohama | 144,000 |

*Korea.*

| Year. | | Population. |
|---|---|---|
| 1895 | Seoul | 250,000 |

*Siam.*

| Year. | | Population. |
|---|---|---|
| 1895 | Bangkok | 200,000 |

*Southwest Asia.*

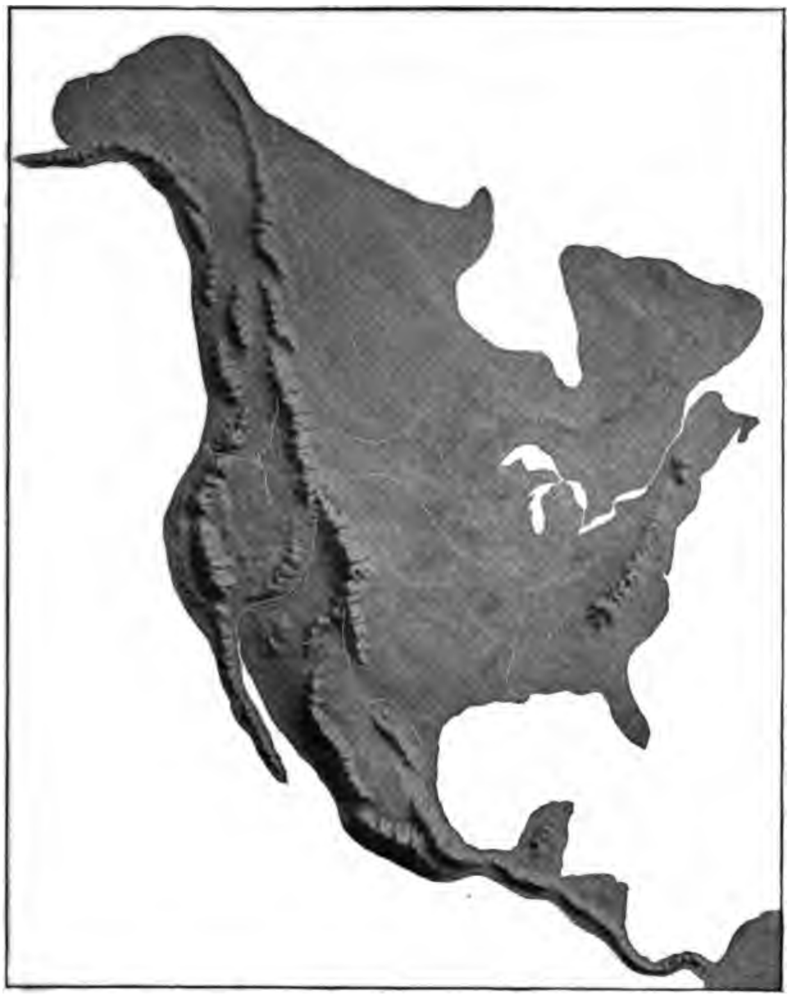
| Year. | | Population. |
|---|---|---|
| 1895 | Teherân | 210,000 |
| 1895 | Smyrna | 200,000 |
| 1895 | Damascus | 200,000 |
| 1895 | Tabriz | 180,000 |
| 1895 | Bagdad | 180,000 |
| 1895 | Aleppo | 130,000 |
| 1895 | Ispahân | 80,000 |
| 1895 | Kábul | 60,000 |
| 1895 | Kandahár | 50,000 |
| 1895 | Mecca | 45,000 |
| 1895 | Jerusalem | 41,000 |
| 1895 | Herát | 30,000 |

### AFRICA.

| Year. | | Population. |
|---|---|---|
| 1895 | Cairo | 418,000 |
| 1895 | Alexandria | 230,000 |
| 1895 | Fez | 140,000 |
| 1895 | Morocco | 140,000 |
| 1895 | Tunis | 125,000 |
| 1895 | Tananarivo | 100,000 |
| 1891 | Algiers | 83,000 |
| 1891 | Cape Town | 83,000 |
| 1891 | Oran | 74,000 |
| 1895 | Zanzibar | 30,000 |
| 1895 | Freetown | 30,000 |
| 1895 | Tangiers | 30,000 |
| 1895 | Tripoli | 30,000 |
| 1891 | Kimberely | 29,000 |
| 1895 | Port Said | 18,000 |
| 1891 | Monrovia | 5,000 |

### OCEANIA.

| Year. | | Population. |
|---|---|---|
| 1893 | Melbourne | 443,000 |
| 1893 | Sydney | 420,000 |
| 1893 | Adelaide | 141,000 |
| 1891 | Auckland | 51,000 |
| 1891 | Brisbane | 49,000 |
| 1891 | Dunedin | 46,000 |
| 1891 | Wellington | 33,000 |
| 1891 | Hobart | 25,000 |
| 1890 | Honolulu | 23,000 |



## Rivers, — Lengths and Drainage Areas.[1]

| Name. | System. | Length in Miles. | Basin Area Sq. Miles. |
|---|---|---|---|
| **NORTH AMERICA.** | | | |
| Colorado | Pacific | 1,100 | 250,000 |
| Columbia | Pacific | 1,400 | 250,000 |
| Mackenzie | Arctic | 2,400 | 440,000 |
| Missouri-Mississippi | Atlantic | 4,200 | 1,250,000 |
| Nelson | Atlantic | 1,800 | 355,000 |
| Rio Grande | Atlantic | 1,800 | 180,000 |
| St. Lawrence | Atlantic | 2,000 | 350,000 |
| Yukon | Atlantic | 2,000 | — |
| **SOUTH AMERICA.** | | | |
| Amazon | Atlantic | 4,000 | 2,500,000 |
| La Plata | Atlantic | 2,300 | 1,250,000 |
| Orinoco | Atlantic | 1,500 | 300,000 |
| San Francisco | Atlantic | 1,680 | 190,000 |
| **EUROPE.** | | | |
| Danube | Atlantic | 2,000 | 300,000 |
| Dnieper | Atlantic | 1,230 | 175,000 |
| Dwina | Arctic | 700 | 140,000 |
| Elbe | Atlantic | 550 | 42,000 |
| Rhine | Atlantic | 960 | 65,000 |
| Rhone | Atlantic | 550 | 33,000 |
| Seine | Atlantic | 497 | 23,000 |
| Thames | Atlantic | 215 | 6,000 |
| Volga | Interior | 2,300 | 500,000 |
| **ASIA.** | | | |
| Amur | Pacific | 1,500 | 600,000 |
| Brahmaputra | Indian | 2,000 | 425,000 |
| Ganges | Indian | 1,800 | 450,000 |
| Hoang-Ho | Pacific | 2,700 | 540,000 |
| Indus | Indian | 2,000 | 320,000 |
| Lena | Arctic | 2,550 | 600,000 |
| Obi | Arctic | 2,500 | 920,000 |
| Yang-tse | Pacific | 3,300 | 500,000 |
| **AFRICA.** | | | |
| Kongo | Atlantic | 3,300 | 1,500,000 |
| Niger | Atlantic | 3,500 | 600,000 |
| Nile | Atlantic | 4,000 | 1,400,000 |
| Zambezi | Indian | 1,800 | 440,000 |

### Guide Maps for Drawing and Modeling the Continents.

The relief maps on this page and on the two following pages are intended as guides for drawing and modeling the continents. These maps are purposely made very simple, yet they show the natural features which exert the greatest influence upon the distribution of climates, plants and animals.

Pupils should learn to sketch these maps from memory, without the aid of straight guide-lines, except such as they themselves invent.

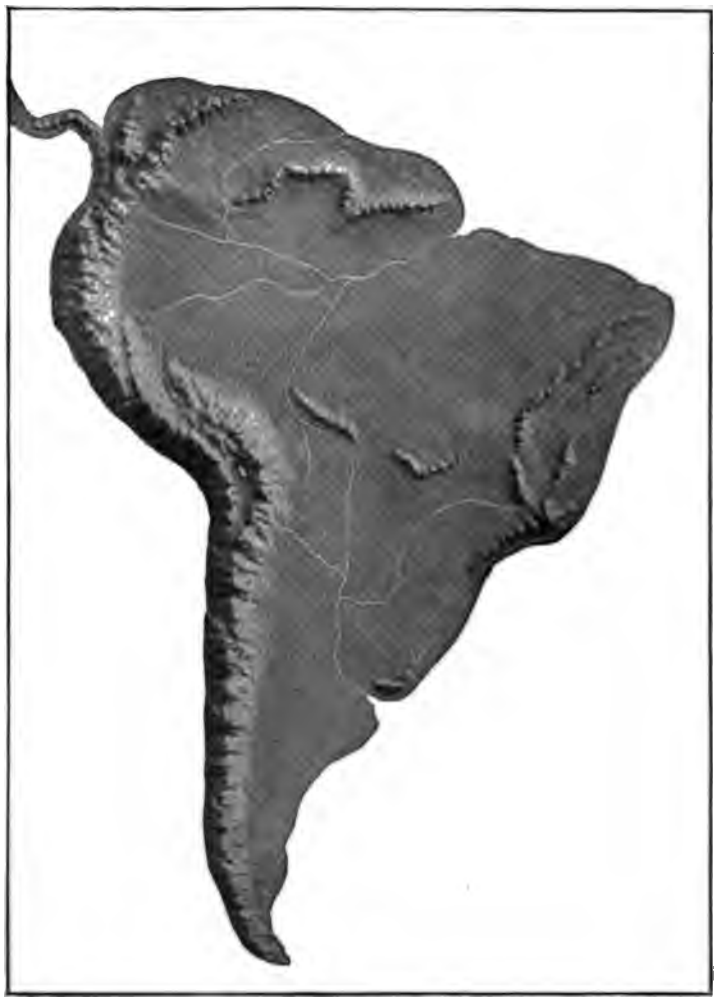
The *Teachers' Manual* offers suggestions upon methods of drawing and modeling the continents.

### Areas of Continents and Oceans.

| | Square Miles. | | Square Miles. |
|---|---|---|---|
| North America | 8,000,000 | Pacific | 70,000,000 |
| South America | 6,850,000 | Atlantic | 35,000,000 |
| Europe | 3,800,000 | Indian | 23,000,000 |
| Asia | 17,000,000 | Antarctic | 7,000,000 |
| Africa | 11,500,000 | Arctic | 4,000,000 |
| Australia | 3,000,000 | Inland Waters | 750,000 |

### Total Population of the World, 1,500,000,000.

| | | | |
|---|---|---|---|
| Caucasian | 690,000,000 | Christians | 400,000,000 |
| Mongolian | 600,000,000 | Buddhists | 500,000,000 |
| Negro | 150,000,000 | Mohammedans | 200,000,000 |
| Malay | 35,000,000 | Bramanists | 150,000,000 |
| American | 12,000,000 | Jews | 8,000,000 |
| Mixed Races | 13,000,000 | Pagans and others | 242,000,000 |



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[1] The lengths of rivers, and the areas of their basins, are in all cases estimates. Those of Africa are least known. The basin of the Murray river, in Australia, is thought to contain about 500,000 square miles. The area of the Yukon basin cannot now be estimated.

## Indian Reservations in the United States.

| States and Territories. | Area of Indian Reservations. | | Population on Reservations (Indians). |
|---|---|---|---|
| | Acres. | Square Miles. | |
| **Arizona** | 6,400,037 | 10,000 | 35,277 |
| **California** | 438,868 | 686 | 12,514 |
| **Colorado** | 1,094,400 | 1,710 | 1,002 |
| **Florida** | . . . | . . . | 450 |
| **Idaho** | 2,088,091 | 3,263 | 4,185 |
| **Indian Territory** | 19,879,573 | 31,062 | 71,856 |
| **Iowa** | 2,900 | 4 | 389 |
| **Kansas** | 73,796 | 115 | 1,102 |
| **Michigan** | 19,799 | 31 | 7,428 |
| **Minnesota** | 2,254,781 | 3,523 | 6,194 |
| **Montana** | 9,382,400 | 14,660 | 10,722 |
| **Nebraska** | 114,550 | 179 | 3,863 |
| **Nevada** | 954,135 | 1,491 | 8,500 |
| **New Mexico** | 9,495,645 | 14,837 | 9,882 |
| **New York** | 87,677 | 137 | 5,160 |
| **North Carolina** | 65,211 | 102 | 2,885 |
| **North Dakota** | 3,812,833 | 5,958 | 7,877 |
| **Oklahoma** | 7,231,747 | 11,300 | 12,676 |
| **Oregon** | 1,929,105 | 3,014 | 4,523 |
| **South Dakota** | 10,271,501 | 16,049 | 18,561 |
| **Texas** | . . . | . . . | 290 |
| **Utah** | 3,972,480 | 6,207 | 2,267 |
| **Washington** | 4,046,564 | 6,323 | 9,924 |
| **Wisconsin** | 446,521 | 698 | 9,387 |
| **Wyoming** | 1,810,000 | 2,828 | 1,724 |
| **Miscellaneous** | . . . | . . . | 728 |
| **Total, 1893** | 85,872,614 | 134,176 | 249,366 |
| **Total, 1880** | 154,741,349 | 241,800 | 255,327 |

## Heights of Principal Mountains.

### NORTH AMERICA.

| Name. | Location. | Height in feet. |
|---|---|---|
| **Mt. Logan** | Canada | 19,500 |
| **Mt. St. Elias** | Canada | 18,010 |
| **Popocatepetl** | Mexico | 17,784 |
| **Orizaba** | Mexico | 17,380 |
| **Mt. Hooker** | Canada | 15,700 |
| **Mt. Brown** | Canada | 16,000 |
| **Mt. Whitney** | California | 14,898 |
| **Mt. Rainier** | Washington | 14,444 |
| **Mt. Shasta** | California | 14,440 |
| **Longs peak** | Colorado | 14,271 |
| **Pikes peak** | Colorado | 14,147 |
| **Fremonts peak** | Wyoming | 13,576 |
| **Wrangell** | Alaska | 12,066 |
| **Mt. Hood** | Oregon | 11,934 |
| **Mt. Mitchell** | North Carolina | 6,711 |
| **Mt. Washington** | New Hampshire | 6,288 |
| **Mt. Marcy** | New York | 5,467 |
| **Mt. Katahdin** | Maine | 5,385 |
| **Jorullo** | Mexico | 4,265 |

### SOUTH AMERICA.

| | | |
|---|---|---|
| **Aconcagua** | Chile | 22,422 |
| **Chimborazo** | Ecuador | 21,420 |
| **Arequipa** | Peru | 20,320 |
| **Cotopaxi** | Ecuador | 18,880 |
| **Tolima** | Colombia | 18,069 |
| **Roraima** | Venezuela | 7,874 |
| **Itacolumi** | Brazil | 5,740 |
| **Itambe** | Brazil | 4,300 |

### EUROPE.

| | | |
|---|---|---|
| **Elbruz** | Russia | 18,526 |
| **Mt. Blanc** | France | 15,810 |
| **Monte Rosa** | Italy | 15,208 |
| **Olympus** | Turkey | 9,745 |
| **Etna** | Sicily | 9,652 |
| **Ymesfield** | Norway | 8,543 |
| **Ben-Nevis** | Scotland | 4,368 |
| **Vesuvius** | Italy | 3,948 |
| **Snowdon** | Wales | 3,571 |
| **Stromboli** | Lipari Islands | 3,090 |

### ASIA.

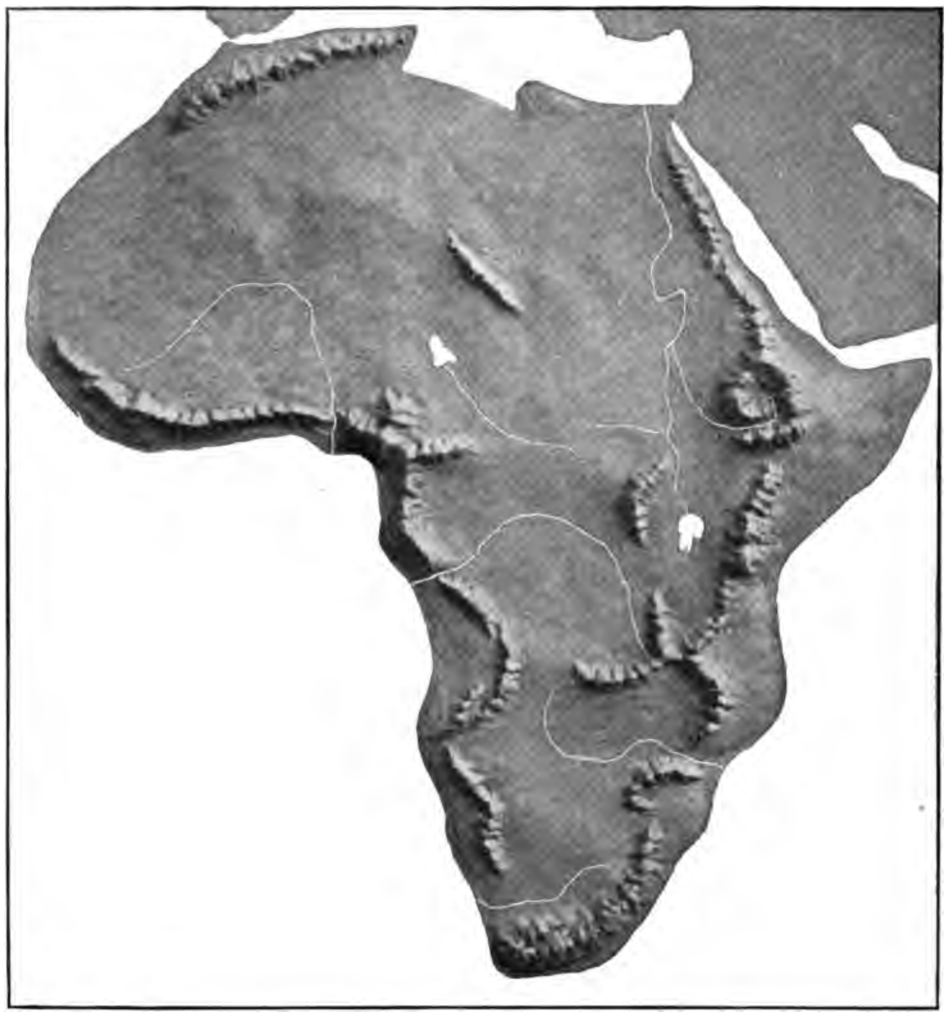
| | | |
|---|---|---|
| **Mt. Everest** | India | 29,002 |
| **Dapsang** | Tibet | 28,278 |
| **Kunchinjunga** | India | 28,156 |
| **Demavend** | Persia | 18,500 |
| **Ararat** | Turkey | 17,260 |
| **Mt. Hermon** | Palestine | 11,000 |
| **Mt. Sinai** | Turkey | 8,593 |

### AFRICA.

| | | |
|---|---|---|
| **Kilima-Njaro** | East Africa | 19,600 |
| **Kenia** | East Africa | 18,045 |
| **Tenerife** | Canary Islands | 12,000 |
| **Mt. Miltsin** | Morocco | 11,400 |
| **Peak of Pico** | Azores | 7,013 |

### OCEANIA.

| | | |
|---|---|---|
| **Mauna Loa** | Hawaiian Islands | 13,600 |
| **Mt. Kosciusco** | Australia | 7,176 |
| **Kilauea** | Hawaiian Islands | 4,040 |



## Principal Lakes of the World.

| Name. | Area in Sq. Miles. | Elevation in Feet. | Depth in Feet. |
|---|---|---|---|
| Aral Sea | 26,000 | 48 | . . . |
| Caspian Sea | 170,000 | — 84 | 3,000 |
| Dead Sea | 320 | — 1,312 | 700 |
| Great Salt Lake | 2,000 | 4,200 | 60 |
| Lake Baikal | 12,500 | 490 | 4,500 |
| Lake Chapala | 1,300 | 7,000 | . . . |
| Lake Erie | 7,750 | 497 | 120 |
| Lake Huron | 20,000 | 555 | 700 |
| Lake Ladoga | 7,000 | 55 | 730 |
| Lake Michigan | 22,000 | 590 | 875 |
| Lake Nicaragua | 3,650 | 130 | 240 |
| Lake Ontario | 6,950 | 210 | 735 |
| Lake Superior | 31,500 | 628 | 1,008 |
| Lake Titicaca | 4,000 | 12,847 | . . . |
| Lake Victoria | 40,000 | 3,300 | . . . |

## Leading Cities of the United States.

| Cities. | Population (1890). |
|---|---|
| New York, N. Y. | 1,515,301 |
| Chicago, Ill. | 1,099,850 |
| Philadelphia, Pa. | 1,046,964 |
| Brooklyn, N. Y. | 806,343 |
| St. Louis, Mo. | 451,770 |
| Boston, Mass. | 448,477 |
| Baltimore, Md. | 434,439 |
| San Francisco, Cal. | 298,997 |
| Cincinnati, Ohio | 296,908 |
| Cleveland, Ohio | 261,353 |
| Buffalo, N. Y. | 255,664 |
| New Orleans, La. | 242,039 |
| Pittsburg, Pa. | 238,617 |
| Washington, D. C. | 230,392 |
| Detroit, Mich. | 205,876 |
| Milwaukee, Wis. | 204,468 |
| Newark, N. J. | 181,830 |
| Minneapolis, Minn. | 164,738 |
| Jersey City, N. J. | 163,003 |
| Louisville, Ky. | 161,129 |
| Omaha, Neb. | 140,452 |
| Rochester, N. Y. | 133,896 |
| St. Paul, Minn. | 133,156 |
| Kansas City, Mo. | 132,716 |
| Providence, R. I. | 132,146 |
| Denver, Colo. | 106,713 |
| Indianapolis, Ind. | 105,436 |
| Allegheny, Pa. | 105,287 |
| Albany, N. Y. | 94,923 |
| Columbus, O. | 88,150 |
| Syracuse, N. Y. | 88,143 |
| Worcester, Mass. | 84,655 |
| Toledo, O. | 81,434 |
| Richmond, Va. | 81,388 |
| New Haven, Conn. | 81,298 |
| Paterson, N. J. | 78,347 |
| Lowell, Mass. | 77,696 |
| Nashville, Tenn. | 76,168 |
| Scranton, Pa. | 75,215 |
| Fall River, Mass. | 74,398 |
| Cambridge, Mass. | 70,028 |
| Atlanta, Ga. | 65,553 |
| Memphis, Tenn. | 64,495 |

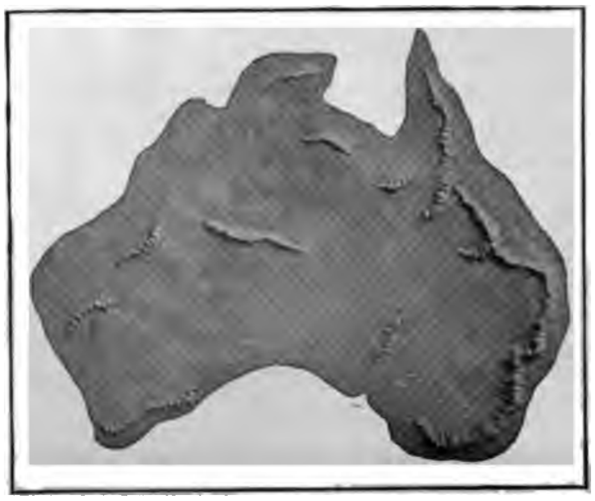
## The United States.

| States and Territories. | Area in Square Miles. | Population (1890). |
|---|---|---|
| Alabama | 52,250 | 1,513,017 |
| Alaska | 531,410 | 31,795 |
| Arizona | 113,020 | 59,620 |
| Arkansas | 53,850 | 1,128,179 |
| California | 158,360 | 1,208,130 |
| Colorado | 103,925 | 412,198 |
| Connecticut | 4,990 | 746,258 |
| Delaware | 2,050 | 168,493 |
| District of Columbia | 70 | 230,392 |
| Florida | 58,680 | 391,422 |
| Georgia | 59,475 | 1,837,353 |
| Idaho | 84,800 | 84,385 |
| Illinois | 56,650 | 3,826,351 |
| Indiana | 36,350 | 2,192,404 |
| Indian Territory | 31,400 | 186,490 |
| Iowa | 56,025 | 1,911,896 |
| Kansas | 82,080 | 1,427,096 |
| Kentucky | 40,400 | 1,858,635 |
| Louisiana | 48,720 | 1,118,587 |
| Maine | 33,040 | 661,086 |
| Maryland | 12,210 | 1,042,390 |
| Massachusetts | 8,315 | 2,238,943 |
| Michigan | 58,915 | 2,093,889 |
| Minnesota | 83,365 | 1,301,826 |
| Mississippi | 46,810 | 1,289,600 |
| Missouri | 69,415 | 2,679,184 |
| Montana | 146,080 | 132,159 |
| Nebraska | 77,510 | 1,058,910 |
| Nevada | 110,700 | 45,761 |
| New Hampshire | 9,305 | 376,530 |
| New Jersey | 7,815 | 1,444,933 |
| New Mexico | 122,580 | 153,593 |
| New York | 49,170 | 5,997,853 |
| North Carolina | 52,250 | 1,617,947 |
| North Dakota | 70,795 | 182,719 |
| Ohio | 41,060 | 3,672,316 |
| Oklahoma | 39,030 | 61,834 |
| Oregon | 96,030 | 313,767 |
| Pennsylvania | 45,215 | 5,258,014 |
| Rhode Island | 1,250 | 345,506 |
| South Carolina | 30,570 | 1,151,149 |
| South Dakota | 77,650 | 328,808 |
| Tennessee | 42,050 | 1,767,518 |
| Texas | 265,780 | 2,235,523 |
| Utah | 84,970 | 207,905 |
| Vermont | 9,565 | 332,422 |
| Virginia | 42,450 | 1,655,980 |
| Washington | 69,180 | 349,390 |
| West Virginia | 24,780 | 762,794 |
| Wisconsin | 56,040 | 1,686,880 |
| Wyoming | 97,890 | 60,705 |

◆

## States Having the Largest Negro Population.

| States. | 1890. |
|---|---|
| Georgia | 858,996 |
| Mississippi | 744,749 |
| South Carolina | 689,141 |
| Alabama | 679,299 |
| Virginia | 635,858 |
| North Carolina | 562,565 |
| Louisiana | 560,192 |
| Texas | 489,588 |
| Tennessee | 430,881 |
| Arkansas | 309,427 |



# PRONOUNCING VOCABULARY.

**Key.**—āle, câre, ărm, fināl; ạll, ēve, ĕnd, hĕr, recẹnt; īce, ĭll, admịral; ōld, fôr, ŏn, anchọr; ūse, ŭp, fûr, awfụl; fōōd, fŏŏt; ch *as in* chop; g *as in* go; ng *as in* sing; ṇ *as in* iṇk; th *as in* thin; tẖ *as in* the; ñ *as in* banyan; oi *as in* oil; ow *as in* cow; ɴ *nearly like* ng *in* sing (*French nasal*).

**Abaco**, ä′bä-kō.
Aberdeen, ăb-ẹr-dēn′.
Abomey, ăb-ō-mā′.
Abyssinia, ăb-ĭs-sĭn′ĭ-ạ.
Acapulco, ä-kä-pōōl′kō.
Acaray, ä-kär′ā.
Aconcagua, ä-kŏn-kä′gwä.
Acropolis, ă-krŏp′ō-lĭs.
Adelaide, ăd′ẹ-lād.
Aden, ä′dẹn.
Adige, ăd′ĭ-jē.
Adirondack, ăd-ị-rŏn′dạk.
Adrian, ā′drĭ-ạn.
Adrianople, ăd-rĭ-ạn-ō′pl.
Adriatic, ăd-rē-ăt′ĭk.
Ægean, ē-jē′ạn.
Afghánistán, äf-gän-ĭs-tän′.
Africa, ăf′rĭ-kạ.
Aguas Calientes, ä′guäs kä-lē-ān′-tĕs.
Aix-la-Chapelle, āks-lä-shä-pĕl′.
Ajaccio, ä-yät′chō.
Akron, ăk′rọn.
Alabama, ăl-ạ-bä′mạ.
Alameda, ä-lä-mā′dạ.
Alamo, ä′lä-mō.
Alaska, ā-lăs′kạ.
Albany, ạl′bạ-nĭ.
Albemarle, ăl′bẹ-märl.
Alberta, ăl-bĕrt′ạ.
Albuquerque, äl-bōō-kār′kā.
Alderney, ạl′dẹr-nĭ.
Aleutian, ā-lū′shĭ-ạn.
Alexandria, ăl-ĕgz-ăn′drĭ-ạ.
Algeria, ăl-jē′rĭ-ä.
Algiers, ăl-jērz′.
Alleghany, ăl′ẹ-gā-nĭ.
Allegheny, ăl′ẹ-gā-nĭ.
Alpena, ăl-pē′nạ.
Alpine, ăl′pĭn.
Altai, äl-tī′.
Altamaha, ạl-tạ-mạ-hạ′.
Altoona, ăl-tōō′nạ.
Amadeus, ăm-ạ-dē′ŭs.
Amazon, ăm′ạ-zŏn.
Ameer, ă-mēr′.
Amiens, ä′mĭ-ăɴ.
Amsterdam, ăm′stẹr-dăm.
Amur, ä-mōōr′.
Anaconda, ăn-ạ-kŏn′dạ.
Anam, ā-năm′.
Andean, ăn-dē′ạn.
Andes, ăn′dēz.
Andorra, än-dōr′rä.
Androscoggin, ăn-drọs-cŏg′ĭn.
Angers, ŏɴ-zhā′.
Anglesey, ăn′gl-sē.
Annapolis, ăn-năp′ō-lĭs.
Anniston, ăn′ĭs-tọn.
Antarctic, ăn-tärk′tĭk.
Anticosti, ăn-tĭ-kŏs′tĭ.
Antigua, än-tē′gạ.
Antilles, än-tĭl′lēz, *or* ŏɴ′tēl′.
Antofagasta, än-tō-fä-gäs′tä.
Antwerp, ănt′wẹrp.
Apache, ä-pä′chā.
Apalachee, ăp-ạ-lăch′ē.
Apalachicola, ä-pạ-lăch-ĭ-kō′lä.
Apennines, ăp′ẹn-nīnz.
Apia, ä′pē-ä.
Appalachian, ăp-pạ-lā′chĭ-ạn.
Appomattox, ăp-pō-măt′tọks.
Apteryx, ăp′tē-rĭx.
Arab, ăr′ăb.
Arabian, ă-rā′bĭ-ạn.
Arabic, ăr′ă-bĭk.
Aral, ăr′ạl.
Ararat, ăr′ạ-răt.
Archangel, ärk-ān′jĕl.
Archipelago, är-kĭ-pĕl′ă-gō.
Arctic, ärk′tĭk.
Ardennes, är-dĕn′.
Arequipa, ä-rā-kē′pä.
Argentine, är′jĕn-tīn.
Arizona, ăr-ĭ-zō′nạ.
Arkansas, är′kạn-sạ′.
Armadillo, är-mä-dĭl′lō.
Arnhem, ärn′hĕm.
Arno, är′nō.
Arthabaska, är-thạ-băs′kạ.
Aryan, är′yạn.
Asben, äs-bĕn′.
Asheville, ăsh′vĭl.
Asia, ā′shĭ-ạ.
Asiatic, ā-shĭ-ăt′ĭk.
Assiniboia, ăs-sĭn-ĭ-boi′ạ.
Assiniboin, ăs-sĭn′ĭ-boin.
Astoria, ăs-tō′rĭ-ạ.
Astrakhan, äs-trä-kän′.
Atacama, ä-tä-kä′mä.
Atbara, ät-bä′rä.
Atchafalaya, ăch-ạf-ạ-lī′ạ.
Atchison, ăch′ĭ-sọn.
Athabasca, ăth-ạ-băs′kạ.
Athens, ăth′ĕnz.
Atlanta, ăt-lăn′tạ.
Atlantic, ăt-lăn′tĭk.
Atoll, ă-tŏl′.
Auburn, ạ′bûrn.
Auckland, ạk′lạnd.
Augusta, ạ-gŭs′tạ.
Aurora, ạ-rō′rạ.
Au Sable, ạ sä′bl.
Austin, ạs′tĭn.
Australia, ạs-trā′lĭ-ạ.
Australis, ạs-trā′lis.
Austria, ạs′trĭ-ạ.
Avon, ā′vọn.
Azov, ä-zŏv′.
Azores, ạ-zōrz′.

**Babiroussa**, băb-ĭ-rōōs′sạ.
Bahama, bạ-hā′mạ.
Bahia, bä-ē′ä.
Baikal, bī′käl.
Baku, bä-kōō′.
Balearic, băl-ẹ-ăr′ĭk.
Bali, bä′lē.
Balize, bä-lēz′.
Balkan, bäl-kän′.
Balkash, bäl-käsh′.
Ballarat, băl-lạ-răt′.
Baltic, bạl′tĭk.
Baltimore, bạl′tĭ-mọr *or* -mōr.
Baluchistan, bä-lōō-chĭs-tän′.
Banca, băṇ′kạ.
Bangkok, băṇ′kŏk′.
Bangor, băn′gôr.
Banteng, băn′tĕng.
Bantry, băn′trĭ.
Barbuda, bär-bōō′dä.
Barcelona, bär-sẹ-lō′nä.
Barmen, bär′mẹn.
Basel, bä′zẹl.
Basque, bäsk.
Batavia, bä-tä′vĭ-ä.
Baton Rouge, băt-ŭn rōōzh′.
Bayonne, bā-yŏn′.
Bayou, bī′ōō.
Beatrice, bē′ạ-trēs.
Beaufort, bō′fôrt (N. C.) *or* bū′-fûrt (S. C.).
Bechuanaland, bĕk-ū-ăn′ạ-lănd.
Bedouin, bĕd′ōō-ēn.
Belfast, bĕl′făst (Me.) *or* bĕl-fäst′ (Ireland).
Belgium, bĕl′jĭ-ŭm.
Belgrade, bĕl-grād′.
Bellaire, bĕl-âr′.
Belle Isle, bĕl-īl′.
Benares, bĕn-ä′rĕz.
Bengal, bĕn-gạl′.
Benguela, bĕn-gā′lä.
Ben-Lomond, bĕn-lō′mọnd.
Ben-Nevis, bĕn-nĕv′ĭs.
Benue, bĕn-ōō-ē′.
Berber, bĕr′bẹr.
Berea, bĕr′ē-ạ.
Bergwerk, bĕrg′vĕrk.
Bering, bē′rĭng.
Berlin, bĕr′lĭn *or Ger.* bĕr-lēn′.
Bermuda, bẹr-mū′dạ.
Bern, bĕrn.
Bethlehem, bĕth′lẹ-hĕm.
Bhutan, bōō-tän′.
Biddeford, bĭd′ẹ-fọrd.
Billiton, bĭl′lị-tŏn′.
Binghamton, bĭng′ạm-tọn.
Birkenhead, bĕrk′ẹn-hĕd.
Birmingham, bĕr′mĭng-ŭm.
Biscay, bĭs′kā.
Bismarck, bĭs′märk.
Bissao, bĭs-sowɴ′.
Bloemfontein, blĕm-fŏn′tīn.
Bogotá, bō-gō-tä′.
Böhmerwald, bē′mẹr-vält.
Boisé, boi-zā′.
Bokhara, bŏk-ä′rä.
Bolan, bō′lạn.
Bolivia, bọ-lĭv′ĭ-ạ.
Bologna, bō-lōn′yä.
Boma, bō′mä.
Bombay, bŏm-bā′.
Boothia, bōō′thĭ-ạ.
Bordeaux, bôr-dō′.
Borealis, bō-rē-ā′lĭs.
Borgne, bŏrñ.
Borneo, bôr′nē-ō.
Bosna-Serai, bŏs-nä-sĕr-ī′.
Bosnia, bŏz′nĭ-ä.
Bosporus, bŏs′pō-rŭs.
Bothnia, bŏth′nĭ-ạ.
Boyne, boin.
Brahma, brä′mạ.
Brahmaputra, brä-mạ-pōō′trạ.
Brazil, brạ-zĭl′.
Brazos, brä′zọs.
Bremen, brā′mĕn.
Breslau, brĕs′low.
Brest, brĕst.
Brindisi, brēn′dē-sē.
Brisbane, brĭs′bān.
Brooklyn, brook′lĭn.
Brulé, brū′lā.
Brunswick, brŭnz′wĭk.
Brussels, brŭs′sẹlz.
Bucharest, bū-kạ-rĕst′.
Budapest, bōō′dạ-pĕst.
Buddha, bŏŏd′dạ.
Buenos Ayres, bō′nŭs ā′rĭz *or Sp.* bwā′nōs ī′rĕs.
Bulgaria, bŏŏl-gā′rĭ-ạ.
Burlington, bûr′lĭng-tọn.
Burma, bûr′mä.
Butte, būt.

**Cadillac**, kăd-ĭl-lăk′.
Cagliari, käl′yä-rē.
Cairo, kā′rō (U. S.); kī′rō (Egypt).
Calais, kăl′ĭs (U. S.); kä-lā′ (France).
Calcutta, kăl-kŭt′tạ.
Caledonia, kăl-ẹ-dō′nĭ-ạ.
California, kăl-ĭ-fôr′nĭ-ạ.
Callao, käl-lä′ō.
Cambodia, kăm-bō′dẹ-ạ.
Cambrian, kăm′brĭ-ạn.
Cambridge, kām′brĭj.
Campêche, käm-pā′chā.
Campos, käm′pōs.
Canada, kăn′ạ-dạ.
Canadian, kạ-nā′dẹ-ạn.
Canary, kạ-nā′rĭ.
Candia, kăn′dẹ-ä.
Cantabrian, kăn-tā′brị-ạn.
Canton, kăn′tọn (U. S.); kăn-tŏn′ (China).
Cape Breton, brĕt′ọn.
Carácas, kä-rä′käs.
Cardiff, kär′dĭf.
Cardigan, kär′dĕ-gạn.
Caribbean, kăr-ĭb-bē′ạn.
Carmarthen, kär-mär′thĕn.
Carolina, kăr-ō-lī′nạ.
Carpathian, kär-pā′thĭ-ạn.
Carpentaria, kär-pĕn-tä′rẹ-ạ.
Cartagena, kär-tạ-jē′nạ.
Cascade, kăs-kād′.
Caspian, kăs′pĭ-ạn.
Cassava, kăs′sạ-vạ.
Cassiquiari, kä-sē-kē-ä′rē.
Catoche, kä-tō′shā.
Caucasian, kạ-kā′shạn.
Caucasus, kạ′kạ-sŭs.
Cayenne, kā-yĕn′.
Cayuga, kā-yōō′gạ.
Celebes, sĕl′ẹ-bēz.
Cenis, sẹ-nē′.
Cettinje, chā-tēn′yā.
Cévennes, sā-vĕnn′.
Ceylon, sē-lŏn′.
Chad, chăd.
Chamouni, shä-mōō-nē′.
Champlain, shăm-plān′.
Chandeleur, shăn-dẹ-lōōr′.
Chapala, shä-pä′lä.
Charlotte, shär′lọt.
Chatham, chăt′ạm.
Chattahoochee, chăt-tạ-hōō′chē.
Chattanooga, chăt-tă-nōō′gạ.
Chautauqua, chạ-tạ′kwạ.
Chelan, chē-lăn′.
Chelsea, chĕl′sē.
Chemnitz, kĕm′nĭts.
Cherbourg, shĕr′bûrg.
Cherokee, chĕr-ō-kē′.
Chesapeake, chĕs′ạ-pēk.
Chesuncook, chẹ-sŭn′kŏŏk.
Cheviot, chĭv′ẹ-ŭt.
Cheyenne, shī-ĕn′.
Chicago, shẹ-kạ′gō.
Chickasaw, chĭk′ạ-sạ.
Chickasawha, chĭk-ạ-sạ′wạ.
Chihuahua, chē-wä′wä.
Chile, chē′lā.
Chillicothe, chĭl-lĭ-kŏth′ẹ.
Chimborazo, chĭm-bō-rä′zō.
Chinese, chī′nēz.
Chippewa, chĭp′pẹ-wä.
Choctaw, chŏk′tạ.
Christiania, krĭs-tē-ä′nē-ä.
Cimarron, sē-mä-rōn′.
Cinchona, sĭn-kō′nạ.
Cincinnati, sĭn-sĭn-nä′tĭ.
Clyde, klīd.
Cochin China, kō′chĭn chī′nạ.
Coeur d'Alene, kûr-dä-lān′.
Cohoes, kō-hōz′.
Colima, kō-lē′mä.
Cologne, kō-lōn′.
Colombia, kō-lŏm′bē-ä.
Colon, kō-lōn′.
Colorado, kŏl-ọ-rä′dō.
Como, kō′mō.
Conception, kọn-sĕp′shŭn.
Concord, kŏṇk′ụrd.
Connecticut, kŏn-nĕt′ĭ-kŭt.
Constance, kŏn′stạns.
Constantinople, kŏn-stăn′tĭ-nō′pl.
Coosa, kōō′sạ.
Copenhagen, kō′pẹn-hā′gẹn.
Cordova, kŏr′dō-vä.
Corfu, kŏr-fōō′.
Corinth, kŏr′ĭnth.
Corpus Christi, kôr′pŭs krĭs′tē.
Corrientes, kŏr-rē-ĕn′tĕs.
Corsica, kôr′sĭ-kạ.
Costa Rica, kŏs′tä rē′kä.
Cotopaxi, kō-tō-păk′sē.
Covington, kŭv′ĭng-tọn.
Cracow, krā′kō.
Crefeld, krā′fĕlt.
Crevasse, krā-văs′.
Croydon, kroi′dọn.
Cuba, kū′bạ.
Culloden, kŭl-lō′dẹn.
Cumbrian, kŭm′brĭ-ạn.
Curaçao, kū-rạ-sō′.
Cuzco, kōōs′kō.
Cyprus, sī′prŭs.
Czernowitz, chĕr′nō-vĭts.

**Dahomey**, dä-hō′mā.
Dakota, dạ-kō′tạ.
Dallas, dăl′ạs.
Damascus, dạ-măs′kŭs.
Dantzic, dănt′zĭk.
Danube, dăn′ūb.
Dardanelles, där-dạ-nĕlz′.
Darfur, där′fōōr.
Darien, dā′rẹ-ĕn.
Davenport, dăv′ẹn-pōrt.
Debreczin, dā-brĕt′sĭn.
Decatur, dē-kā′tụr.
Deccan, dĕk′kạn.
Delaware, dĕl′ạ-wâr.
Delhi, India, dĕl′lē.
Des Chutes, dā-shōōt′.
Des Moines, dẹ-moin′.
Des Plaines, dā-plān′.
Detroit, dẹ-troit′.
Dijon, dē-zhŏɴ′.
Dnieper, nē′pẹr.
Dniester, nēs′tẹr.
Dominica, dŏm-ẹ-nē′kạ.
Donegal, dŏn-ẹ-gạl′.
Dovrefield, dō-vrẹ-fyĕld′.
Drave, drāv.
Dresden, drĕz′dẹn.
Drogheda, drŏ′hẹ-dạ.
Dubuque, dōō-būk′.
Duluth, dū-lōōth′.
Duncansby, dŭṇ′kạns-bĭ.
Dundalk, dŭn-dạk′.
Dundee, dŭn-dē′.
Dunedin, dŭn-ēd′ĭn.
Dungeness, dŭn-jẹ-nĕs′.
Durango, dōō-rän′gō.
Dwina, dwē′nạ.

**Eau Claire**, ō-klâr′.
Ebro, ē′brō.
Echidna, ē-kĭd′nạ.
Ecuador, ĕk-wä-dōr′.
Edinburgh, ĕd′ịn-bŭr-ō.
Egypt, ē′jĭpt.
Egyptian, ē-jĭp′shạn.
Elba, ĕl′bä.
Elbe, ĕl′bẹ.
Elberfeld, ĕl′bẹr-fĕlt.
Elbruz, ĕl-brōōz′.
Elburz, ĕl-bōōrz′.
Eleuthera, ẹ-lū′thẹr-ä.
Elgin, ĕl′jĭn.
Elmira, ĕl-mī′rạ.
El Paso, ĕl pä′sō.
Elyria, ē-lĭr′ẹ-ạ.
Erne, ĕrn.
Erris, ĕr′rĭs.
Erz, ĕrts.
Escanaba, ĕsk-ä-nạ′bạ.
Essequibo, ĕs-sā-kē′bō.
Etna, ĕt′nạ.
Eubœa, ū-bē′ạ.
Eucalyptus, ū-kạ-lĭp′tŭs.
Euphrates, ū-frā′tēz.
Eurasia, ū-rā′shĭ-ạ.
European, ū-rō-pē′ạn.
Evansville, ĕv′ạnz-vĭl.
Everest, ĕv′ẹr-ĕst.
Eyre, âr.

**Falkland**, fạk′lạnd.
Faribault, făr-ẹ-bō′.
Fezzan, fĕz-zän′.
Fiji, fē′jē.
Findlay, fĭnd′lā.
Finland, fĭn′lạnd.
Fiord, fyôrd.
Firth, fĕrth.
Flamborough, flăm′bŭr-rō.
Floe, flō.
Florida, flŏr′ĭ-dạ.
Fond du Lac, fŏn-dū-lăk′.
Formosa, fôr-mō′sä.
Fort Wayne, wān.
Frankfurt, frăṇk′fōōrt.
Fraser, frā′zẹr.
Fremont, frē-mŏnt′.
Fresno, frĕs′nō.
Fuegian, fū-ē′jĭ-ạn.
Fusiyama, fōō-zĭ-ä′mä.

**Galapagos**, gă-lăp′ā-gōs.
Galatz, gä′läts.
Galilee, găl′ĭ-lē.
Galveston, găl′vẹs-ton.
Galway, gạl′wā.
Ganges, găn′jēz.
Garonne, gä-rōnn′.
Gasconade, găs-kō-nād′.
Genesee, jĕn-ẹ-sē′.
Geneva, jẹ-nē′vạ.
Genoa, jĕn′ọ-ạ.
Georgia, jôr′jĭ-ạ.
Geral, hā-räl′.
Gettysburg, gĕt′ĭz-bûrg.
Ghats, gäts.
Ghent, gĕnt.
Gibraltar, jĭ-brạl′tạr.
Gila, hē′lä.
Girardeau, jē-rär-dō′.
Gironde, zhē-rōɴd′.
Glasgow, glăs′gō.
Gloucester, glŏs′tẹr.
Gloversville, glŭv′ẹrz-vĭl.
Gobi, gō′bē.
Gondar, gŏn′där.
Gondola, gŏn′dọ-lạ.
Gracias a Dios, grä′sē-äs-ä-dē′ōs.

Grampians, grăm′pĭ-ạnz.
Granada, grä-nä′dä.
Gran Chaco, grän chä′kō.
Grand Manan, mạn-ăn′.
Grätz, grĕts.
Greenwich, grēn′wĭch (U. S.); grĕn′ĭj (Eng.).
Grinnell, grĭn-ĕl′.
Guadalajara, gwä-dä-lä-hä′rä.
Guadalquivir, gwä-däl-kē-vēr′.
Guadalupe, gạ′dạ-lōōp′ (U. S.); gwä-dä-lōō′pā (Spanish).
Guanaco, gwạ-nä′kō.
Guanajuato, gwä-nä-hwä′tō.
Guatemala, gwạ-tā-mä′lä.
Guayaquil, gwī-ä-kēl′.
Guernsey, gẽrn′zẹ.
Guiana, gē-ä′nä.
Guinea, gĭn′ē.
Guthrie, gŭth′rẹ.
Guyandotte, gī-ạn-dŏt.

**Hagerstown**, hā′gẹrz-town.
Hainan, hī-nän′.
Haiti, hā′tĭ.
Hakodate, hä-kō-dä′tē.
Halifax, hăl′ę-făks.
Halle, häl′lẹ.
Hamite, hā′mīt.
Hanoi, hä-nō′ē.
Hanover, hăn′ō-vẹr.
Harney, här′nĭ.
Hatteras, hăt′tẹr-ạs.
Havana, hạ-văn′ạ.
Havre, hä′vẹr.
Havre de Grace, hăv′ẹr dẹ gräs.
Hawaii, hä-wī′ē.
Hebrides, hĕb′rĭ-dēz.
Hecla, hĕk′lạ.
Helena, hĕl′ę-nạ.
Helgoland, hĕl′gō-länd.
Henlopen, hĕn-lō′pẹn.
Herát, hẹr-ät′.
Himalaya, hĭm-ä′lạ-yạ.
Hindu-Kush, hĭn′dōō-kōōsh.
Hindustan, hĭn-dọ-stän′.
Hoang-Ho, họ-äng-hō′.
Hoboken, hō′bō-kẹn.
Holston, hōl′stọn.
Holyoke, hōl′yōk.
Hondo, hŏn′dō.
Honduras, hŏn-dōō′rạs.
Hongkong, hŏng-kŏng′.
Honolulu, hō-nō-lōō′lōō.
Hoosac, hōō′sạk.
Housatonic, hōō-sạ-tŏn′ĭc.
Houston, hūs′tọn.
Hudson, hŭd′sọn.
Hué, hōō-ā′.
Humboldt, hŭm′bōlt.
Hungary, hŭn′gạ-rĭ.
Huron, hū′rọn.

**Iberian**, ī-bē′rẹ-ạn.
Idaho, ī′dạ-hō.
Illimani, ēl-yē-mä′nē.
Illinois, ĭl-ĭ-noi′ *or* -noiz′.
Inagua, ē-nä′gwä.
India, ĭn′dĭ-ạ.
Indiana, ĭn-dĭ-ăn′ạ.
Indianapolis, ĭn-dĭ-ăn-ăp′ọ-lĭs.
Indes, ĭn′dēz.
Indus, ĭn′dŭs.
Innsbruck, ĭns′prook.
Inverness, ĭn-vẹr-nĕss′.
Ionian, ī-ō′nĭ-ạn.
Iowa, ī′ō-wạ.
Iquique, ē-kē′kā.
Iran, ē-rän′.
Irkutsk, ĭr-kōōtsk′.
Ironton, ī′ụrn-tọn.
Ishpeming, ĭsh′pẹm-ĭng.
Isle Royale, ēl rwä-yäl′.
Italian, ĭ-tăl′yạn.
Itasca, ī-tăs′kạ.
Ithaca, ĭth′ạ-kạ.

**Jalapa**, hä-lä′pä.
Jamaica, jạ-mā′kạ.
Japan, jạ-păn′.
Jassy, yä′sē.
Java, jä′vạ.
Jersey, jẽr′zĭ.
Joliet, jō′lẹ-ĕt.
Joplin, jŏp′lĭn.
Juan de Fuca, hōō-än′ dā fōō′kä.
Juan Fernandez, fĕr-nän′dĕth.
Juarez, hwä′rĕth.
Juneau, jū-nō′.
Jungfrau, yōōng′frow.
Juniata, jū-nĭ-ăt′ạ.
Jura, jū′rä.

**Kábul**, kä′bul.
Kadiak, kăd-yăk′.
Kaffir, kăf′fẽr.
Kalahari, kä-lä-hä′rĭ.
Kama, kä′mä.
Kamchatka, kăm-chăt′kạ.
Kamerun, kä-mā-rōōn′.
Kanawha, kạ-nạ′wạ.
Kankakee, kăn-kạ-kē′.
Kansas, kăn′zạs.
Kara, kä′rä.
Karakorum, kä-rä-kō′rŭm.
Kashgar, kăsh-gär′.
Kashmir, kăsh-mēr′.
Kaskaskia, kăs-kăs′kĭ-ạ.
Katadahin, kạ-tä′dĭn.
Katoomba, kā-tōōm′bạ.
Kauai, kow-ī′ē.
Kecskemet, kĕch-kĕm-āt′.
Kenia, kā-nē′ä.
Kennebec, kĕn-ę-bĕk′.
Kentucky, kĕn-tŭk′ĭ.
Keokuk, kē′ō-kŭk.
Khaibar, kä′ē-bär.
Khartum, kär-tōōm′.
Khelat, kẹl-ät′.
Khin-Gan, kĭn-gän′.
Khiva, kē′vä.
Khyber, kī′bẽr.
Kiakhta, kē-äk′tä.
Kilauea, kē-low-ā′ä.
Kilima-Njaro, kĭl′ē-män-jä-rō′.
Killarney, kĭl-är′nĭ.
Kilmarnock, kĭl-mär′nọk.
Kiolen, kyē′lẹn.
Kioto, kē-ō′tō.
Kirghiz, kĭr-gēz′.
Kirin, kĭr′ĭn.
Kirkcaldy, kịr-kạl′dĭ.
Kittery, kĭt′ẹr-ĭ.
Klamath, klä′mạth.
Klausenburg, klow′zẹn-bōōrg.
Knoxville, nŏks′vĭl.
Koala, kō-ä′lä.
Kong, kŏng.
Kongo, kŏn′gō.
Königsberg, kē′nĭgs-bĕrg.
Koran, kō′rạn.
Kordofan, kôr-dō-fän′.
Korea, kō-rē′ạ.
Kronstadt, krōn′stät.
Kuen-Lun, kwĕn-lōōn′.

**Labrador**, lăb-rạ-dôr′.
Lachine, lä-shēn′.
Lacrosse, lạ-krôs′.
Ladoga, lăd′ō-gạ.
Ladrones, lạ-drōnz′.
Lafayette, lä-fā-ĕt′.
Lagoon, lä-gōōn′.
La Guayra, lä-gwī′rä.
Lamoille, lạ-moil′.
Lancaster, lăn̤k′ạs-tẹr.
Landes, lŏɴd.
Lansing, lăn′sĭng.
La Paz, lä-päth′.
Lapland, lăp′lạnd.
La Plata, lä-plä′tä.
Laporte, lạ-pōrt′.
Laramie, lăr′ạ-mē.
Laredo, lạ-rā′dō.
Lasalle, lạ-săl′.
Lassa, läs′sä.
Lassen, lăs′sẹn.
Las Vegas, läs-vā′gäs.
Laurentian, lạ-rĕn′shẹ-ạn.
Lausanne, lō-zän′.
Leadville, lĕd′vĭl.
Leavenworth, lĕv′ẹn-wọrth.
Lebanon, lĕb′ạ-nọn.
Leghorn, lĕg′hôrn.
Leicester, lĕs′tẹr.
Leipsic, līp′sĭk.
Leith, lēth.
Lemberg, lĕm′bĕrg.
Lena, lē′nạ.
Leon, lā-ōn′ (Sp.).
Leone, lē-ō′nē.
Lexington, lĕk′sĭng-tọn.
Liberia, lī-bē′rĭ-ạ.
Libyan, lĭb′ę-ạn.
Liége, lē-āzh′.
Lille, lēl.
Lima, lī′mạ (U. S.); lē′mä (Peru).
Limerick, lĭm′er-ĭk.
Limoges, lē-mōzh′.
Lipari, lĭp′ạ-rē.
Lisbon, lĭz′bọn.
Lisburn, lĭs′bûrn.
Liverpool, lĭv′ẹr-pōōl.
Llano Estacado, lyä′nō-ĕs-tä-kä′-dō.
Loanda, lō-än′dä.
Loch, lŏk.
Loess, lĕs.
Lofoden, lō-fō′dẹn.
Logan, lō′gạn.
Loire, lwär.
Lombok, lŏm-bŏk′.
Londonderry, lŭn′dŭn-dĕr-ĭ.
Los Angeles, lōs-ăn′gĕl-ĕs.
Lough Neagh, lŏh nā′.
Louisiana, lōō-ē-zē-ä′nạ.
Louisville, lōō′ĭs- *or* lōō′ĭ-vĭl.
Lourenço Marques, lō-rĕn′sō mär-kĕs′.
Lucerne, lōō-sẽrn′.
Luray, lū-rā′.
Lurgan, lûr′gạn.
Luxemburg, lŭks′ĕm-bûrg.
Luzon, lōō-zōn′.
Lyons, lī′ŏnz.

**Macao**, mä-kow′.
Macassar, mạ-kăs′sạr.
Mackenzie, mạ-kĕn′zĭ.
Mackinac, măk′ĭ-nạ.
Macon, mā′kụn.
Madagascar, măd-ạ-găs′kạr.
Madeira, mạ-dē′rạ.
Madras, mạ-drăs′.
Madrid, măd′rĭd (U. S.); mạ-drĭd′ (Spain).
Maelstrom, māl′strẽm.
Magdalena, mäg-dä-lā′nä.
Magdeburg, mäg′dẹ-bōōrg.
Magellan, mạ-jĕl′ạn.
Maine, mān.
Malacca, mạ-lăk′ạ.
Malay, mạ-lāy′.
Malaysia, mạ-lā′shĭ-ạ.
Malden, mŏl′dẹn.
Malheur, mäl-hẽr′.
Managua, mä-nä′gwä.
Manchester, măn′chẹs-tẹr.
Manchuria, măn-chōō′rẹ-ạ.
Mandalay, män′dä-lā.
Manilla, mạ-nĭl′lạ.
Manistee, mạn-ĭs-tē′.
Manitoba, măn-ĭ-tō-bä′.
Manitou, măn′ę-tōō.
Manitoulin, măn-ę-tōō′lĭn.
Manzanillo, män-thä-nēl′yō.
Maori, mä′ō-rē.
Maracaibo, mä-rä-kī′bō.
Marañon, mä-rän′yōn.
Marathon, măr′ạ-thŏn.
Marcy, mär′sĭ.
Marias, mạ-rī′ạz.
Marmora, mär′mọ-rạ.
Marseilles, mär-sālz′.
Martinique, mär-tĭ-nēk′.
Mashonaland, mạ-shō′nạ-lănd.
Maskat, măs-kăt′.
Massachusetts, măs-ạ-chū′sẹts.
Massaua, mäs-sow′ä.
Massillon, măs′ĭl-ọn.
Matabeleland, măt-ạ-bēl′lănd.
Matagorda, măt-ạ-gôr′dạ.
Matamoros, măt-ạ-mō′rọs.
Matapan, mä-tä-pän′ (Gr.).
Mauch Chunk, mạk-chŭn̤k′.
Maui, mow′ē.
Maulmain, mạl-mīn′.
Mauna Kea, mow′nä-kā′ä.
Mauna Loa, -lō′ä.
Mauritius, mạ-rĭsh′ĭ-ŭs.
Mazatlan, mä-sät-län′.
Mediterranean, mĕd′ĭ-tẹr-rā′nẹ-ạn.
Mekong, mā-kŏng′.
Melanesia, mĕl-ạn-ē′shĭ-ạ.
Melbourne, mĕl′bûrn.
Memphremagog, mĕm-frẹ-mā′gŏg.
Memphis, mĕm′fĭs.
Menai, mĕn′ī.
Mendocino, mĕn-dō-sē′nō.
Menomonee, mẹ-nŏm′ọ-nē.
Meramec, mĕr′ạ-mĕk.
Merida, mĕr′ĭ-dạ.
Meriden, mĕr′ĭ-dĕn.
Merrimac, mĕr′ĭ-mạk.
Mersey, mẽr′zĭ.
Merthyr-Tydfil, mẽr-thẹr-tĭd′fĭl.
Messina, mĕs-sē′nä.
Metz, mĕts.
Mexico, mĕks′ĭ-kō.
Miami, mī-ăm′ĭ.
Michigan, mĭsh′ĭ-gạn.
Micronesia, mī-krō-nē′shĭ-ạ.
Milan, mĭl′ạn *or* mĭ-lăn′.
Mille Lacs, mēl-lăk′.
Milo, mē′lō (Greece).
Milwaukee, mĭl-wạ′kē.
Minch, mĭnch.
Mindanáo, mēn-dä-nä′ō.
Minneapolis, mĭn-ę-ăp′ọ-lĭs.
Minnehaha, mĭn-ę-hä′hä.
Minnesota, mĭn-ę-sō′tạ.
Mississippi, mĭs-ĭs-ĭp′ĭ.
Missoula, mĭz-ōō′lạ.
Missouri, mĭs-ōō′rĭ.
Mitylene, mĭt-ē-lē′nē.
Mobile, mō-bēl′.
Mohammed, mō-hăm′mĕd.
Mohave, mō-hä′vā.
Mohawk, mō′hạk.
Molokai, mō-lō-kī′.
Moluccas, mō-lŭk′kạz.
Mombaza, mŏm-băs′ạ.
Monaco, mŏn′ä-kō.
Monastir, mŏn-ạs-tēr′.
Moncton, mŭn̤k′tọn.
Mongolia, mŏn-gō′lĭ-ạ.
Monongahela, mō-nŏn-gạ-hē′lạ.
Monrovia, mŏn-rō′vĭ-ạ.
Montana, mŏn-tä′nạ.
Montauk, mŏn-tạk′.
Mont Blanc, mōɴ blŏɴ′ *or* mount blăn̤k.
Mont Cenis, mōɴ′ sẹ-nē′ *or* mount.
Montenegro, mōn-tā-nā′grō.
Monterey, mŏn-tẹ-rā′.
Montevideo, mŏn-tē-vĭd′ē-ō.
Montgomery, mọnt-gŭm′ẹr-ĭ.
Monticello, mŏn-tē-sĕl′lō.
Montpelier, mŏnt-pē′lĭ-ẹr.
Montreal, mŏnt-rẹ-ạl′.
Moraine, mō-rān′.
Moravia, mō-rā′vĭ-ạ.
Moray, mŭr′ā.
Morelia, mō-rā′lē-ạ.
Morocco, mō-rŏk′ō.
Moscow, mŏs′kō.
Mount Diablo, dē-ä′blō.
Mount Lyell, lī′ĕl.
Mount St. Elias, ę-lī′ạs.
Mount Tyndall, tĭn′dạl.
Mozambique, mō-zạm-bēk′.
Mukden, mōōk-dĕn′.
Mull, mŭl.
Munich, mū′nĭk.
Murray, mŭr′rā.
Muskatine, mŭs-kạ-tēn′.
Muskegon, mŭs-kē′gọn.

**Namur**, nā′mûr.
Nan-Ling, nän′lĭng.
Nantes, nănts.
Nanticoke, năn′tĭ-cōk.
Nantucket, năn-tŭk′ẹt.
Naples, nā′plz.
Narragansett, năr-rạ-găn′sẹt.
Nashua, năsh′ū-ạ.
Nassau, năs′ạ.
Natchez, nă′chẹz.
Navajo, nä′vä-hō.
Naxos, năk′sŏs.
Nebraska, nẹ-brăs′kạ.
Neches, nĕch′ĕz.
Negritos, nē-grī′tōz.
Nepal, nā-päl′.
Netherlands, nĕth′ẹr-lạndz.
Neuse, nūs.
Nevada, nẹ-vä′dạ.
Newark, nū′ạrk.
Newfoundland, nū′fọnd-lạnd.
New Hampshire, -hămp′shịr.
New Orleans, -ôr′lẹ-ạnz.
Newport, nū′pōrt.
New Zealand, -zē′lạnd.
Niagara, nī-ăg′ạ-rạ.
Nicaragua, nē-kä-rä′gwä.
Nice, nēs.
Niger, nī′jẹr.
Nîmes, nēm.
Ningpo, nĭng-pō′.
Niobrara, nī-ō-brä′rạ.
Nipigon, nĭp′ĭ-gŏn.
Norfolk, nôr′fọk.
Norristown, nŏr′ĭs-town.
Norseman, nôrs′mạn.
Norwegian, nŏr-wē′jĭ-ạn.
Norwich, nôr′wĭch (U. S.), nŏr′rĭj (Eng.).
Nottingham, nŏt′ĭng-ạm.
Nova Scotia, nō′vạ skō′shĭ-ạ.
Nova Zembla, nō′vạ zĕm′blạ.
Nubia, nū′bĭ-ạ.
Nueces, nwā′sĕs.
Nuremberg, nū′rĕm-bĕrg.
Nyanza, nī-ăn′zạ.
Nyassa, nē-äs′sä.

**Oahu**, ō-ä′hōō.
Oakland, ōk′lạnd.
Oasis, ō′ā-sĭs.
Oaxaca, wä-hä′kä.
Obi, ō′bē.
Ocmulgee, ŏk-mŭl′gē.
Oder, ō′dẹr.
Odessa, ō-dĕs′sạ.
Ogden, ŏg′dĕn.
Ogeechee, ō-gē′chē.
Okanagan, ō-kăn′ạ-gạn.
Okechobee, ō-kē-chō′bē.
Okefinokee, ō-kē-fĭ-nō′kē.
Okhotsk, ō-kōtsk′.
Oklohoma, ōk-lä-hō′mạ.
Oldham, ōld′ạm.
Olympia, ō-lĭm′pĭ-ạ.
Olympus, ō-lĭm′pŭs.
Omaha, ō′mạ-hạ.
Oman, ō-män′.
Omsk, ŏmsk.
Onega, ō-nē′gạ.
Oneida, ō-nī′dạ.
Ontario, ŏn-tā′rĭ-ō.
Oregon, ŏr′ę-gŏn.
Orinoco, ō-rĭ-nō′kō.
Orizaba, ō-rē-thä′bä.
Orkney, ôrk′nē.
Orleans, ŏr-lā-ŏɴs′ (*Fr.*).
Ornithorynchus, ôr-nĭ-thō-rĭn′kŭs.
Osage, ō-sāj′.
Oshkosh, ŏsh′kŏsh.
Oswego, ŏs-wē′gō.
Otranto, ō-trän′tō.
Ottawa, ŏt′tạ-wạ.
Ottumwa, ŏt-tŭm′wạ.
Ouachita, wŏsh′ĭ-tạ.
Ouse, ōōz.
Owyhee, ō-wī′hē.
Ozark, ō-zärk′.

**Pacaraima**, pä-kä-rī′mä.
Pachuca, pä-chōō′kä.
Pacific, pạ-sĭf′ĭk.
Paducah, pạ-dū′kạ.
Pagan, pā′gạn.
Pago, pä′gō.
Pagoda, pä-gō′dä.
Paisley, pāz′lĭ.
Palambang, pä-lĕm-bäng′.
Palermo, pạ-lẽr′mō.
Palestine, păl′ẹs-tīn.
Pamir, pä-mēr′.
Pamlico, păm′lĭ-kō.
Pampas, päm′päs.
Panama, păn-ạ-mä′.
Papua, păp′ōō-ạ.
Pará, pä-rä′.
Paraguay, pä-rä-gwī′.
Paramaribo, păr-ạ-măr′ĭ-bō.
Parana, pä-rä-nä′.
Paris, păr′ĭs.
Parma, pär′mạ.
Parsee, pär′sē.
Parthenon, pär′thē-nŏn.
Pascagoula, păs-kạ-gōō′lạ.
Passaic, păs-sā′ĭk.
Passamaquoddy, păs-ạ-mạ-kwŏd′ĭ.
Patagonia, păt-ạ-gō′nĭ-ạ.
Paterson, păt′ẹr-sọn.
Patras, pä-träs′.
Pawtucket, pạ-tŭk′ẹt.
Pecos, pā′kōs.
Pedee, pē-dē′.
Peking, pē-kĭng′.
Pe-Ling, pē-lĭng′.
Pennine, pĕn′nīn.
Pennsylvania, pĕn-sĭl-vā′nĭ-ạ.
Penobscot, pẹ-nŏb′scọt.
Pensacola, pĕn-sạ-kō′lạ.
Pentland, pĕnt′lạnd.
Peoria, pē-ō′rĭ-ạ.
Pepin, pē′pĭn.
Pernambuco, pĕr-näm-bōō′kō.
Persia, pẽr′shĭ-ạ.
Perth, pẽrth.
Peru, pẹ-rōō′.
Phenix, fē′nĭks.
Philadelphia, fĭl-ạ-dĕl′fĭ-ạ.
Philae, fī′lē.
Philippine, fĭl′ĭp-ĭn.
Philippopolis, fĭl-ĭp-ŏp′ō-lĭs.
Piedmont, pēd′mŏnt.
Pierre, pēr.
Pietermaritzburg, pē-tẹr-măr′ĭts-bûrg.
Pike, pīk.
Pilcomayo, pĭl-kō-mī′ō.
Pilsen, pĭl′sẹn.
Pindus, pĭn′dŭs.
Pinos, pē′nōs.
Piraeus, pī-rē′ŭs.
Pittsburg, pĭts′bûrg.
Platte, plăt.
Platten See, plä′tẹn zā′.
Plymouth, plĭm′ŭth.
Pnompenh, p′nŏm-pĕn′.
Polyp, pŏl′ĭp.
Pomona, pō-mō′nạ.
Pompeii, pŏm-pā′yē.
Pontchartrain, pŏnt-chạr-trān′.
Popocatepetl, pō-pō′kăt-ā-pā-tl.
Port au Prince, pōrt-ō-prĭns′.
Port Said, -sä-ēd′.
Portsmouth, pōrts′mŭth.
Portugal, pōr′tū-gạl.
Portuguese, pōr′tū-gēz.
Potomac, pō-tō′mạk.
Potosi, pō-tō′sĭ.
Poughkeepsie, pọ-kĭp′sĭ.
Prague, prăg.
Pressburg, prĕs′boorg.
Pretoria, prē-tôr′ē-ạ.
Pribilof, prē-bē-lŏv′.
Providence, prŏv′ĭ-dẹns.
Prussia, prŭsh′yạ.
Pruth, prōōth.
Ptarmigan, tär′mĭ-gạn.
Puebla, pwĕb′lä.

Pueblo, pwĕb′lō.
Puerto Rico, pwĕr′tō rē′kō.
Puget, pū′jẹt.
Puno, po͞o′nō.
Pyrenees, pĭr′ẹ-nēz.

**Quagga,** kwăg′gạ.
Quebec, kwẹ-bĕk′.
Querétaro, kā-rā′tä-rō.
Quincy, kwĭn′zĭ.
Quito, kē′tō.

**Racine,** rạ-sēn′.
Rainier, rā′nēr.
Raleigh, rạ′lạ.
Rangun, rän-go͞on′.
Rappahannock, răp-ạ-hăn′ọk.
Ravenna, rạ-vĕn′ạ.
Reading, rĕd′ĭng.
Rennes, rĕnn.
Rheims, rēmz.
Rhine, rīn.
Rhone, rōn.
Riga, rī′gạ (U. S.); rē′gä (Rus.).
Rio Grande, rē′ō grän′dā.
Rio Janeiro, -zhä-nā′ē-rō.
Rio Negro, -nā′grō.
Rio Virgen, -vēr′hĕn.
Roanoke, rō-ạ-nōk′.
Rochelle, rọ-shĕl′.
Rochester, rŏch′ẹs-tẹr.
Romano, rō-mä′nō.
Romanzof, rō-män′tsŏf.
Rosario, rō-sä′rē-ō.
Rotterdam, rŏt′ẹr-dăm.
Roubaix, ro͞o′bā′.
Rouen, ro͞o′ŏɴ′.
Roumelia, ro͞o-mē′lẹ-ạ.
Roumania, ro͞o-mā′nị-ạ.
Russia, rŭsh′ạ.
Rustchuk, ro͞ost-cho͝ok′.

**Saco,** sạ′kō.
Sacramento, săk-rạ-mĕn′tō.
Saginaw, săg′ĭ-nạ.
Sahara, sä-hä′rạ.
Saïgon, sä′ē-gŏn.
Saint Albans, sānt ạl′bạnz.
Saint Augustine, -ạ′gŭs-tēn.
Saint Bernard, -bĕr-närd′.
Saint Clair, -klâr′.
Saint Croix, -kroi′.
Saint Gothard, -gō-tärd′.
Saint Helena, sĕnt hẹ-lē′nạ.
Saint Lawrence, sānt lạ′rẹns.
Saint Louis, -lo͞o′ĭs *or* -lo͞o′ĭ.
Saint Petersburg, -pē′tẹrz-bûrg.
Saint Roque, -rōk.
Saint Sophia, -sō-fē′ä.
Sakhalin, sä-khä-lēn′.
Salem, sā′lẹm.
Salford, sạl′fọrd.
Salinas, sạ-lē′nạs.
Salisbury, sạlz′bẹr-ĭ.
Salonika, sä-lō-nē′kä.
Saltillo, säl-tēl′yō.
Salvador, säl-vä-dōr′.
Salzburg, sälts′bo͝org.
Samarkand, säm-ạr-känd′.
Samoa, sä-mō′ä.
San Antonio, sän än-tō′nĭ-ō.
San Bernardino, -bĕr-när-dē′nō.
San Cristobal, -krēs-tō′bäl.
Sandhurst, sănd′hụrst.
San Diego, săn dē-ā′gō.
Sandusky, săn-dŭs′kĭ.
San Francisco, -frăn-sĭs′kō.
Sangamon, săn̲′gạ-mŏn.
Sangay, sän-gī′.
Sangre de Cristo, sän′grā dā krēs′-tō.
San Joaquin, sän hō-ä-kēn′.
San José, -hō-sā′.
San Juan, -ho͞o-än′.
San Lucas, -lo͞o′kạs.
San Luis, -lo͞o-ēs′.
San Marino, -mä-rē′nō.
San Pablo, -pä′blō.
Santa Barbara, săn′tạ-bär′bạ-rạ.
Santa Fé, -fā.
Santee, săn′tē′.
Santiago, sän-tē-ä′gō.
Santo Domingo, sän′tō dō-mēn′gō.
Saône, sōn.
Saratoga, săr-ạ-tō′gạ.
Sarawak, sä-rä-wäk′.
Sardinia, sär-dĭn′ĭ-ạ.
Sark, särk.
Saskatchewan, săs-kăch′ẹ-wạn.
Sault Sainte Marie, so͞o sĕnt mā′rĭ.
Savaii, sä-vī′ē.
Savannah, sạ-văn′ạ.
Save, säv.
Scandanavia, skăn-dĭ-nā′vĭ-ạ.
Schenectady, skẹ-nĕk′tạ-dĕ.
Schwarzwald, shvärtz′vält.
Scilly, sĭl′ĭ.
Scotland, skŏt′lạnd.
Scranton, skrăn′tọn.
Seattle, sē-ăt′l.
Sedalia, sē-dā′lĭ-ạ.
Seine, sān.
Seminole, sĕm′ĭ-nōl.
Semite, sĕm′īt.
Semitic, sĕm-ĭt′ĭc.
Seneca, sĕn′ẹ-kạ.
Senegal, sĕn-ẹ-gạl′.
Senegambia, sĕn-ẹ-găm′bĭ-ạ.
Seoul, sā-o͞ol′.
Serra do Mar, sār′rä-dō-mär′.
Servia, sĕr′vĭ-ạ.
Severn, sĕv′ẹrn.
Sevier, sẹ-vēr′.
Shamokin, shạ-mō′kĭn.
Shanghai, shăng-hä′ĭ.
Shannon, shăn′ọn.
Shasta, shăs′tạ.
Sheboygan, shẹ-boi′gạn.
Sheffield, shĕf′fēld.
Shenandoah, shĕn-ăn-dō′ạ.
Shetland, shĕt′lạnd.
Shoshone, shō-shō′nē.
Shreveport, shrēv′pōrt.
Siam, sī-ăm′.
Siberia, sī-bē′rĭ-ạ.
Sicily, sĭs′ĭ-lĭ.
Sierra Madre, sē-ĕr′ạ-mä′drā.
Singapore, sĭn̲-gạ-pōr′.
Sioux, so͞o.
Sitka, sĭt′kạ.
Sligo, slī′gō.
Smyrna, smĕr′nạ.
Snowdon, snō′dọn.
Sofia, sō-fē′ä.
Sogne, sōn.
Sokoto, sō-kō-tō′.
Solway, sŏl′wā.
Somali, sō-mä′lē.
Somerville, sŭm′ẹr-vĭl.
Souris, so͞o-rē′.
Spartivento, spär-tē-vĕn′tō.
Spokane, spō-kăn′.
Stabiae, stä′bĭ-ē.
Staffa, stăf′ạ.
Stanovoi, stä-nō-voi′.
Stettin, stĕt-tēn′.
Steubenville, stū′bẹn-vĭl.
Stirling, stĕr′lĭng.
Stockholm, stŏk′hōlm.
Strangford, străng′fọrd.
Strasburg, sträz′bûrg.
Streator, strē′tọr.
Stuttgart, sto͝ot′gärt.
Suakin, swä′kĭn.
Sucre, so͞o′krẹ.
Sudan, so͞o-dän′.
Sudanese, so͞o-dän-ēz′.
Suez, so͞o-ĕz′.
Suisun, so͞o-ē-so͞on′.
Suliman, so͞o-lē-män′.
Sumatra, so͞o-mä′trä.
Sunda, sŭn′dạ.
Sunderland, sŭn′dẹr-lạnd.
Susquehanna, sŭs-kwẹ-hăn′ạ.
Suwannee, sū-wạ′nē.
Swansea, swŏn′sē.
Sweden, swē′dẹn.
Switzerland, swĭt′zẹr-lạnd.
Sydney, sĭd′nĭ.
Syra, sē′rä.
Syracuse, sĭr′ạ-kūs.
Syria, sĭr′ĭ-ạ.
Szegedin, sĕg-ĕd-ēn′.

**Tabriz,** tä-brēz′.
Tacoma, tä-kō′mä.
Tagus, tā′gŭs.
Tahoe, tä-hō′.
Tahlequah, tä′lē-kwä.
Tallahassee, tăl-ạ-hăs′ē.
Tampa, tăm′pạ.
Tampico, täm-pē′kō.
Tananarivo, tä-nä′nä-rē-vō.
Tanganyika, tän-gän-yē′kä.
Taranto, tä′rän-tō.
Tarim, tä-rēm′.
Tarso, tär′sō.
Tashkent, täsh-kĕnt′.
Tasmania, tăz-mā′nĭ-ạ.
Taunton, tän′tọn.
Taurus, tạ′rŭs.
Tegucigalpa, tā-go͞o-sē-gäl′pä.
Teherân, tẹ-hrän′.
Tehuantepec, tā-wän-tā-pĕk′.
Temesvar, tĕm-ĕsh-vär′.
Tennessee, tĕn-nẹs-sē′.
Terre Haute, tĕr-ẹ-hōt′.
Texas, tĕks′ạs.
Thames, thāmz (U. S.); tĕmz (Eng.).
Theiss, tīs.
Thian-Shan, tē-än′shän.
Tiber, tī′bẹr.
Tibet, tĭ-bĕt′ *or* tĭb′ĕt.
Tibetan, tĭb′ē-tạn.
Tien-tsin, tē-ĕn′tsēn.
Tierra del Fuego, tē-ĕr′rä-dĕl-fwā′gō.
Tiflis, tĭf-lēs′.
Tigris, tī′grĭs.
Timbuktu, tĭm-bo͝ok′to͞o.
Timor, tē-mōr′.
Titicaca, tĭt-ē-kä′kä.
Tocantins, tō-kän-tēns′.
Tokyo, tō′kē-ō.
Toledo, tō-lē′dō.
Tolima, tō-lē′mä.
Tombigbee, tŏm-bĭg′bē.
Tonga, tŏn̲′gạ.
Topeka, tō-pē′kạ.
Toronto, tō-rŏn′tō.
Torrens, tŏr′rĕnz.
Toulon, to͞o′lōɴ.
Toulouse, to͞o′lo͞oz′.
Traverse, trăv′ẹrs.
Triest, trē-ĕst′.
Trinidad, trĭn′ĭ-dăd′.
Tripoli, trĭp′ọ-lĭ.
Tsetse, tsĕt′sē.
Tucson, tū-sŏn′.
Tulere, to͞o-lä′rē.
Tunis, tū′nĭs.
Turin, tū′rĭn.
Turkestan, to͞or-kĭs-tän′.

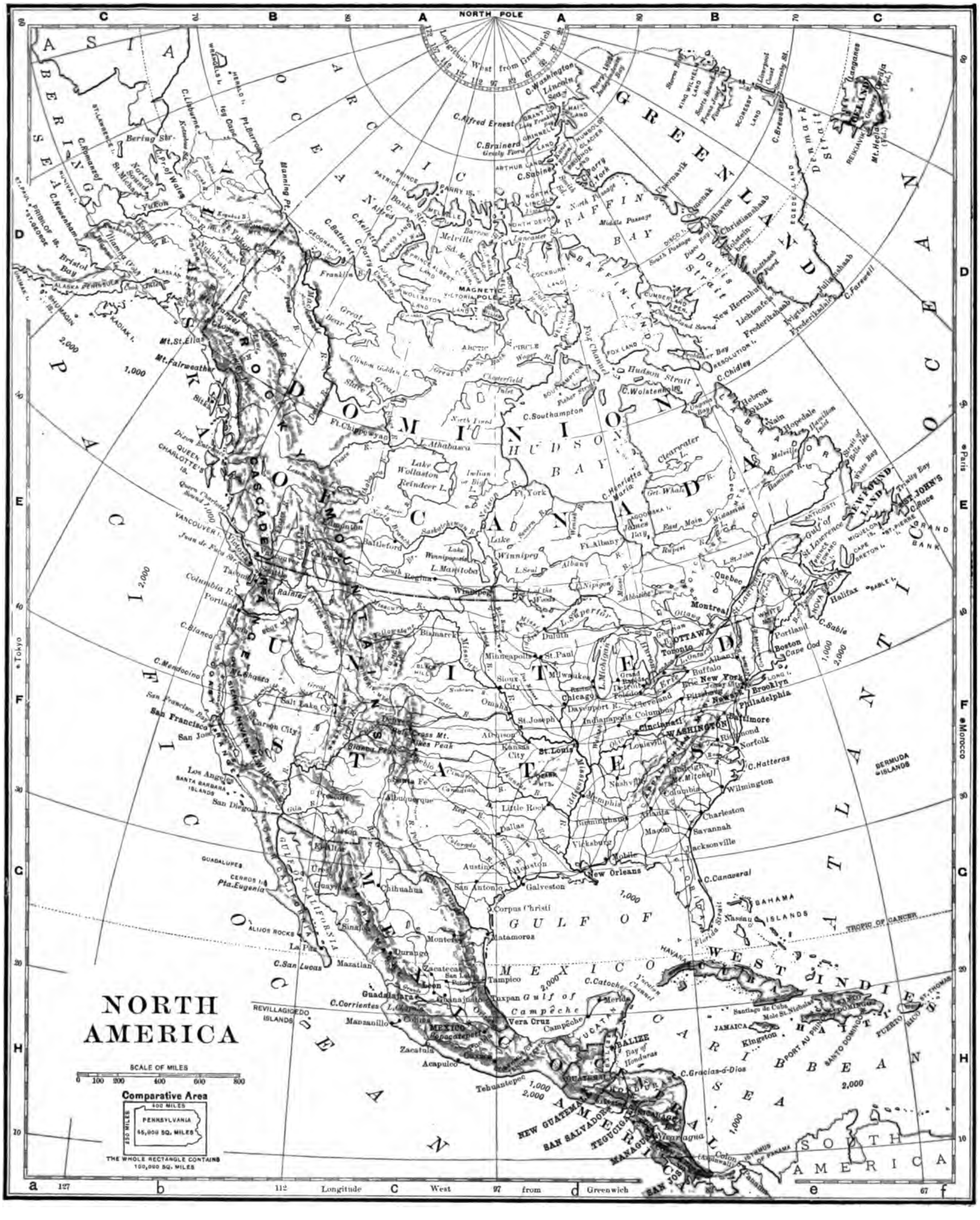
**Ucayale,** o͞o-kī-ä′lā.
Uinta, ū-ĭn′tạ.
Ujiji, o͞o-jē′jē.
Upolu, o͞o-pō-lo͞o′.
Ural, ū′räl.
Uruguay, o͞o-ro͞o-gwī′.
Uspallata, o͞os-päl-yä′tä.
Utah, ū′tä *or* ū′tạ.
Utica, ū′tĭ-kạ.

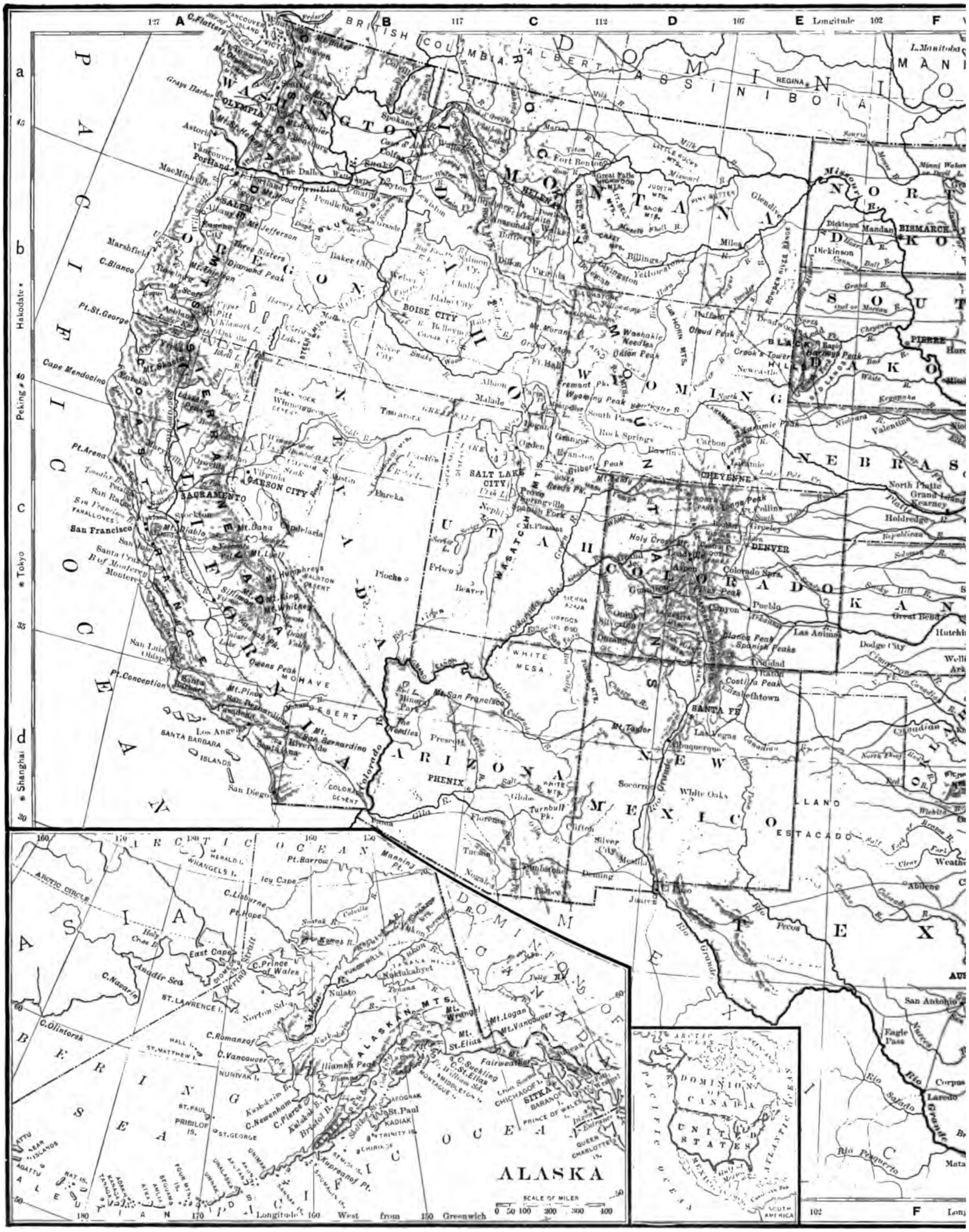
**Valdai,** väl′dī.
Valencia, vạ-lĕn′shĭ-ạ.
Valparaiso, väl-pä-rī′sō.
Vancouver, văn-ko͞o′vẹr.
Vega, vē′gạ.
Venezuela, vĕn-ẹ-zwē′lạ.
Venice, vĕn′ĭs.
Vera Cruz, vā′rä kro͞os′.
Verde, vērd.
Verdigris, vĕr′dĭ-grēs.
Vermilion, vẹr-mĭl′yŭn.
Vermont, vẹr-mŏnt′.
Verona, vẹ-rō′nạ.
Vesuvius, vĕ-sū′vĭ-ŭs.
Verkoyansk, vĕr-kō-yänsk′.
Vienna, vī-ĕn′ạ (U. S.); vē-ĕn′ạ (Austria).
Vincennes, vĭn-sĕnz′.
Virginia, vẹr-jĭn′ĭ-ạ.
Vistula, vĭs′tū-lạ.
Viti Levu, vē′tē lā′vo͞o.
Vladivostok, vlä-dē-vōs-tōk′.
Volga, vŏl′gä.
Vosges, vōzh.

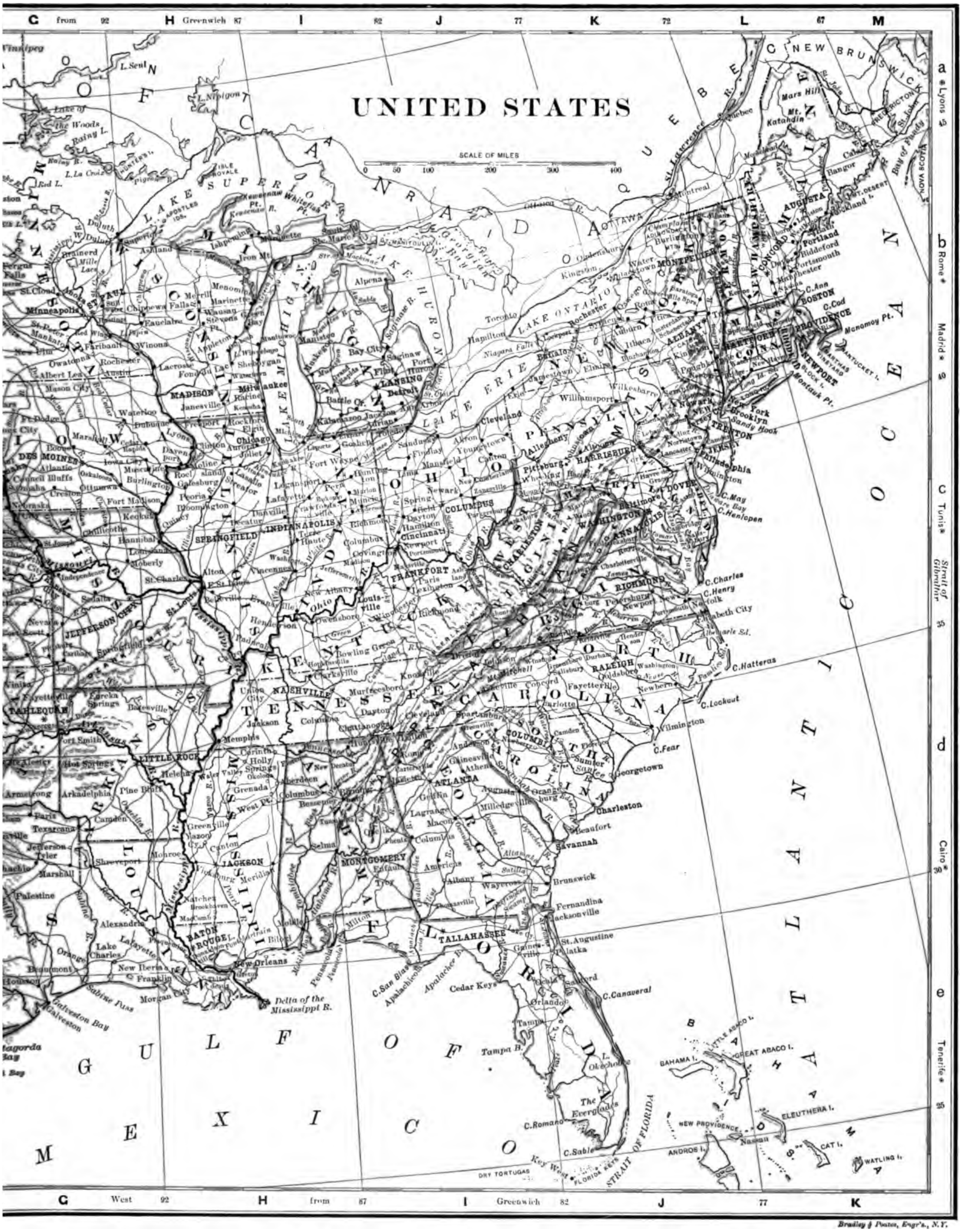
**Wabash,** wạ′bạsh.
Wachusett, wạ-chū′sẹt.
Waco, wā′kō.
Wadai, wä′dī.
Wales, wālz.
Warsaw, wạr′sạ.
Wasatch, wạ′săch.
Waterloo, wạ-tẹr-lo͞o′.
Welland, wĕl′ạnd.
Wellington, wĕl′ĭng-tọn.
Wener, vā′nẹr.
Westminster, wĕst′mĭn-stẹr.
Wetter, vĕt′tẹr.
Wheeling, hwēl′ĭng.
Wichita, wĭch′ĭ-tạ.
Wilkesbarre, wĭlks′băr-ĭ.
Willamette, wĭl-ä′mĕt.
Wilmington, wĭl′mĭng-tọn.
Winnebago, wĭn-ē-bā′gō.
Winnemucca, wĭn-ē-mŭk′ạ.
Winnepesaukee, wĭn-ē-pẹ-sạ′kē.
Winnepeg, wĭn′ĭ-pĕg.
Winnipegosis, wĭn-ĭ-pẹ-gō′sĭs.
Winona, wĭ-nō′nạ.
Winooski, wĭ-no͞os′kī.
Wisconsin, wĭs-kŏn′sĭn.
Woonsocket, wo͞on-sŏk′ẹt.
Worcester, wo͞os′tẹr.
Wyoming, wī-ō′mĭng.

**Yablonoi,** yä-blō-noi′.
Yadkin, yăd′kĭn.
Yakima, yăk′ĭ-mä.
Yakutsk, yä-ko͞otsk′.
Yang-tse, yăng′tsē.
Yarkand, yär-känd′.
Yazoo, yä-zo͞o′.
Yenesei, yĕn-ē-sā′ē.
Yesso, yĕs′sō.
Yokohama, yō-kō-hä′mä.
Yonkers, yŏn̲k′ẹrs.
Yosemite, yō-sĕm′ĭ-tē.
Yucatan, yo͞o-kä-tän′.
Yukon, yo͞o′kŏn.
Yuma, yo͞o′mä.

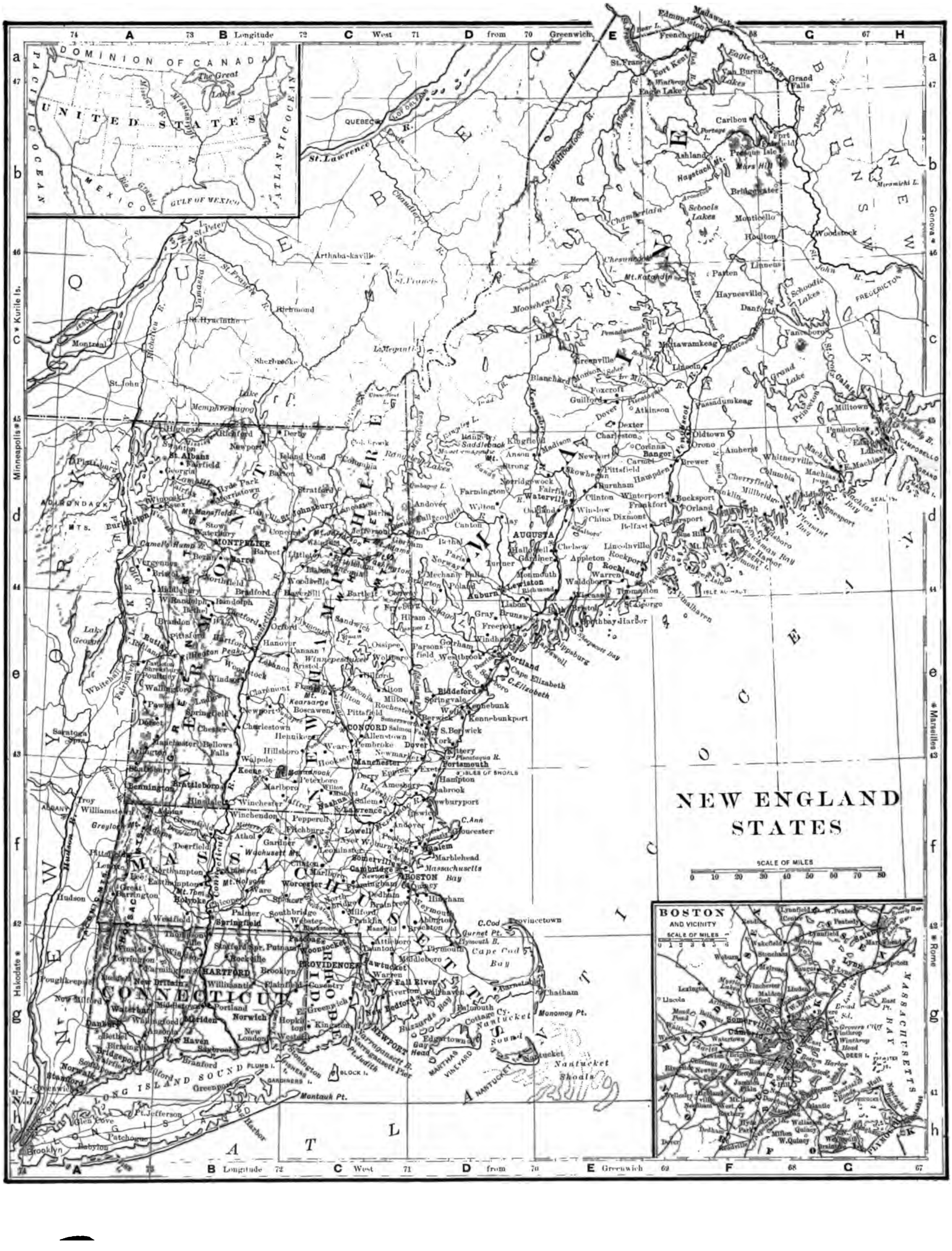
**Zacatecas,** zäk-ạ-tā′kạs.
Zambezi, zäm-bā′zẹ.
Zambezia, zăm-bē′zē-ạ.
Zanesville, zānz′vĭl.
Zante, zän′tā.
Zanzibar, zän′zĭ-bär.
Zululand, zo͞o′lo͞o-lạnd.
Zurich, tsū′rĭk.
Zuyder Zee, zoi′dẹr zā′.


NORTH AMERICA
SCALE OF MILES
0 100 200 400 600 800
Comparative Area
400 MILES
250 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
NORTH POLE
Longitude West from Greenwich
ASIA
BERING SEA
ARCTIC OCEAN
GREENLAND
BAFFIN BAY
DOMINION OF CANADA
HUDSON BAY
UNITED STATES
MEXICO
GULF OF MEXICO
CARIBBEAN SEA
WEST INDIES
CENTRAL AMERICA
SOUTH AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
ROCKY MOUNTAINS
CASCADE
SIERRA NEVADA
TROPIC OF CANCER
ARCTIC CIRCLE
ICELAND
NEWFOUNDLAND
BERMUDA ISLANDS
BAHAMA ISLANDS
OTTAWA
WASHINGTON
MEXICO
New York
Chicago
San Francisco
New Orleans
Montreal
Quebec
Winnipeg
Tokyo
Paris
Morocco
Longitude West from Greenwich
a 127 b 112 c 97 d e 67 f

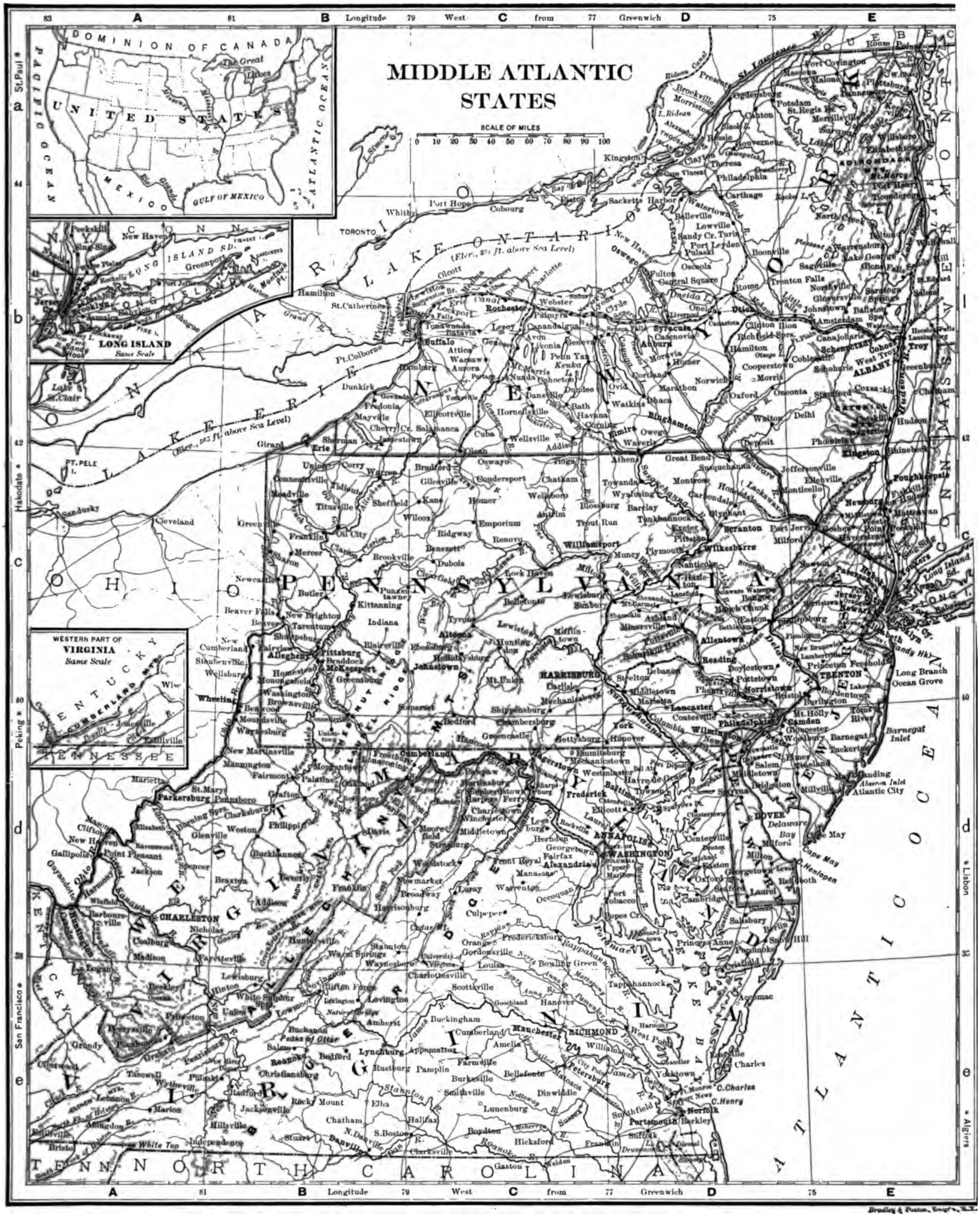

PACIFIC OCEAN
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
COLORADO
ARIZONA
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
TEXAS
MEXICO
BRITISH COLUMBIA
ALBERTA
ASSINIBOIA
DOMINION
OLYMPIA
SALEM
SACRAMENTO
CARSON CITY
BOISE CITY
HELENA
SALT LAKE CITY
CHEYENNE
DENVER
SANTA FE
PHENIX
BISMARCK
PIERRE
San Francisco
Portland
Los Angeles
San Diego
Longitude West from Greenwich
ALASKA
ARCTIC OCEAN
ASIA
BERING SEA
PACIFIC OCEAN
ALASKAN MTS.
SITKA
SCALE OF MILES
0 50 100 200 300 400
DOMINION OF CANADA
UNITED STATES
PACIFIC OCEAN
ATLANTIC OCEAN
SOUTH AMERICA



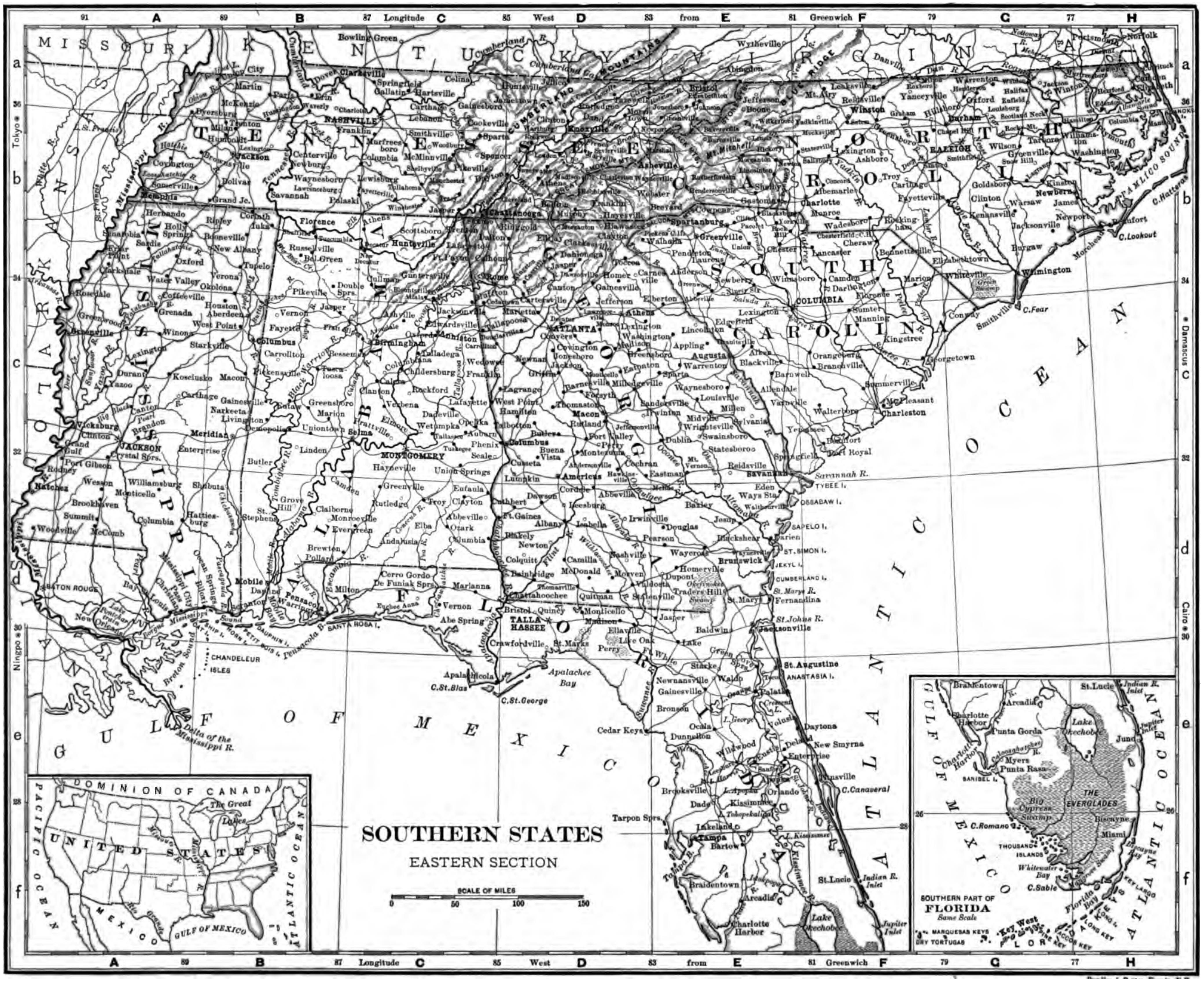
*Bradley & Poates, Engr's., N.Y.*



NEW ENGLAND STATES

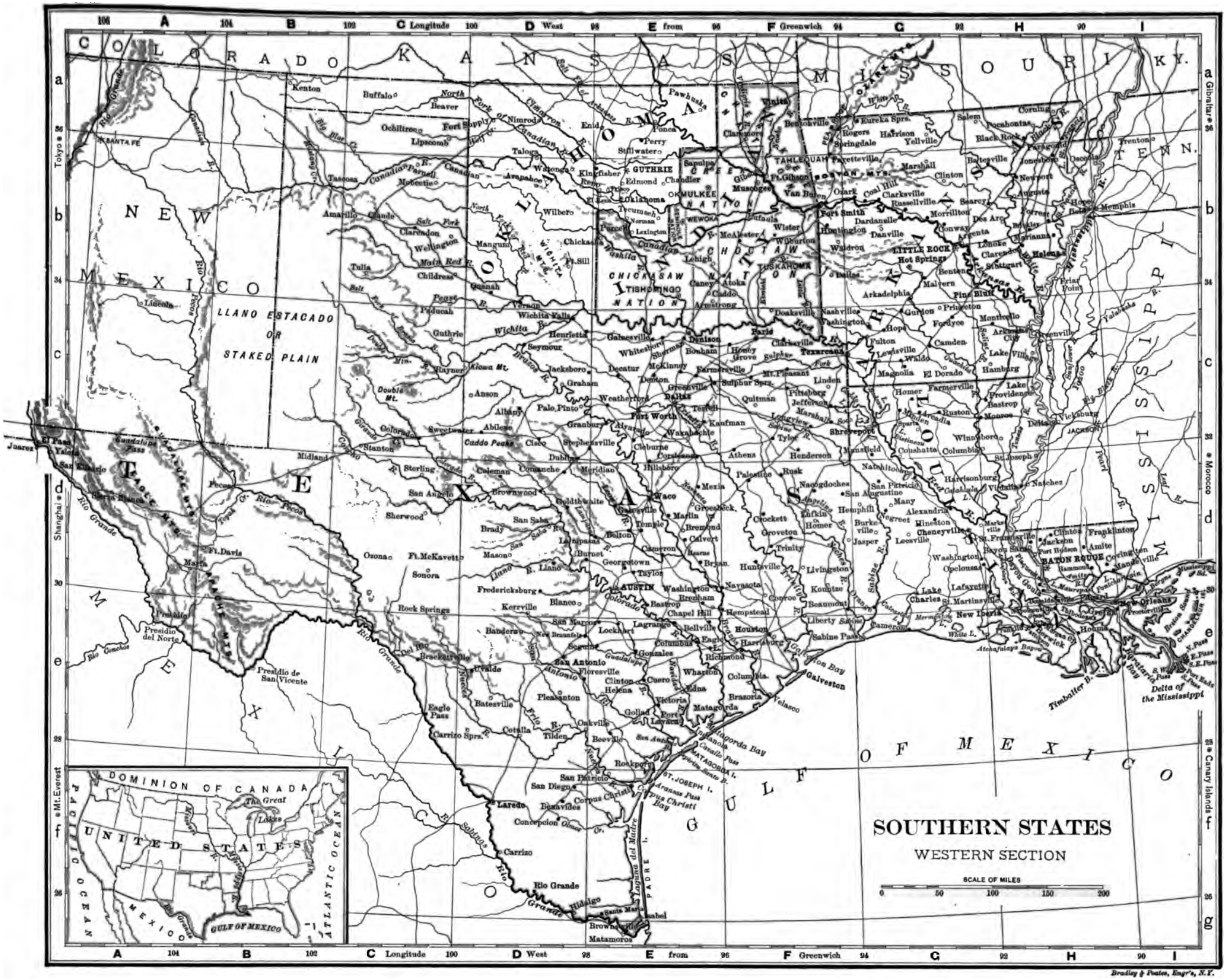


Bradley & Poates, Engr's, N.Y.



SOUTHERN STATES

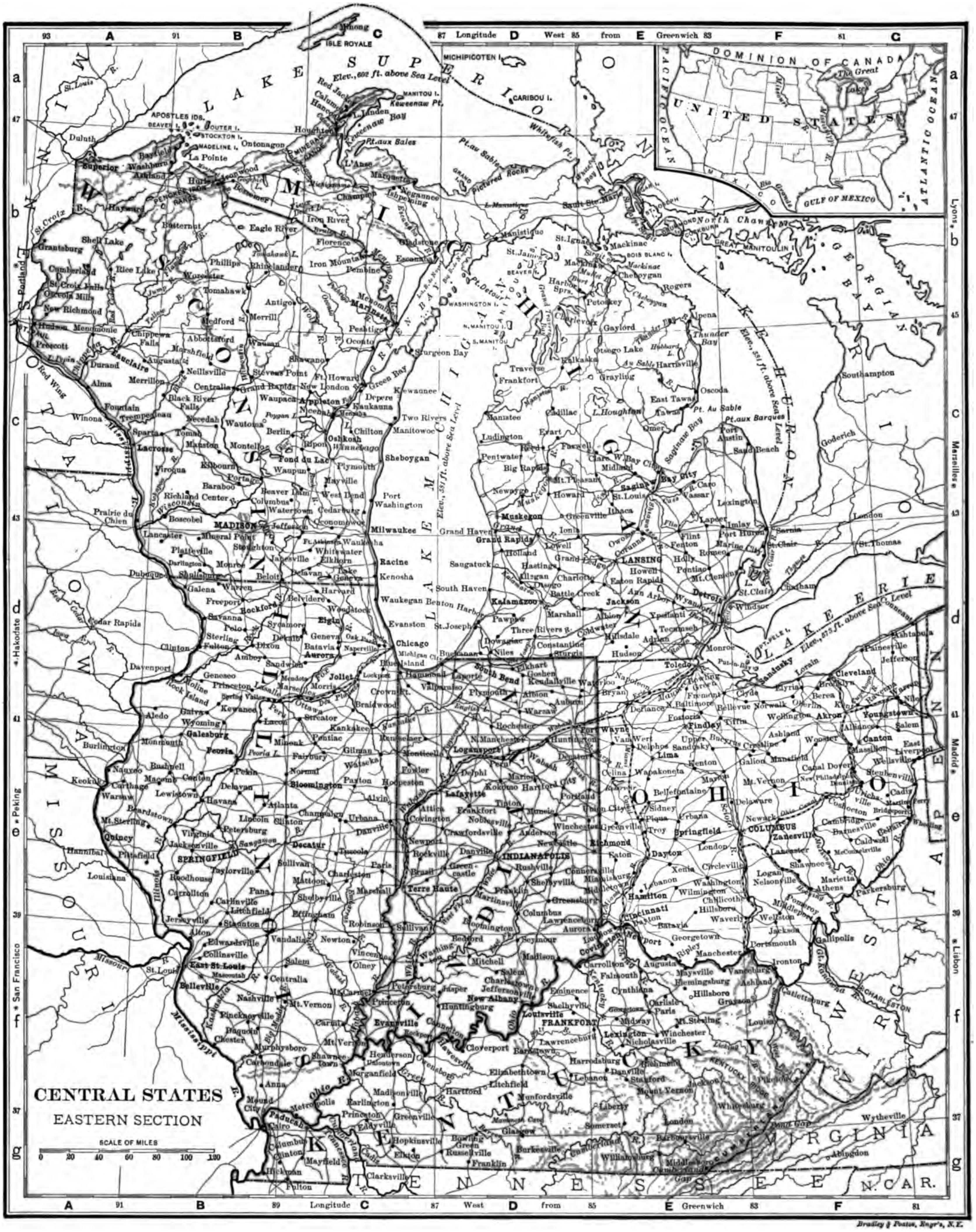
EASTERN SECTION



## SOUTHERN STATES

WESTERN SECTION

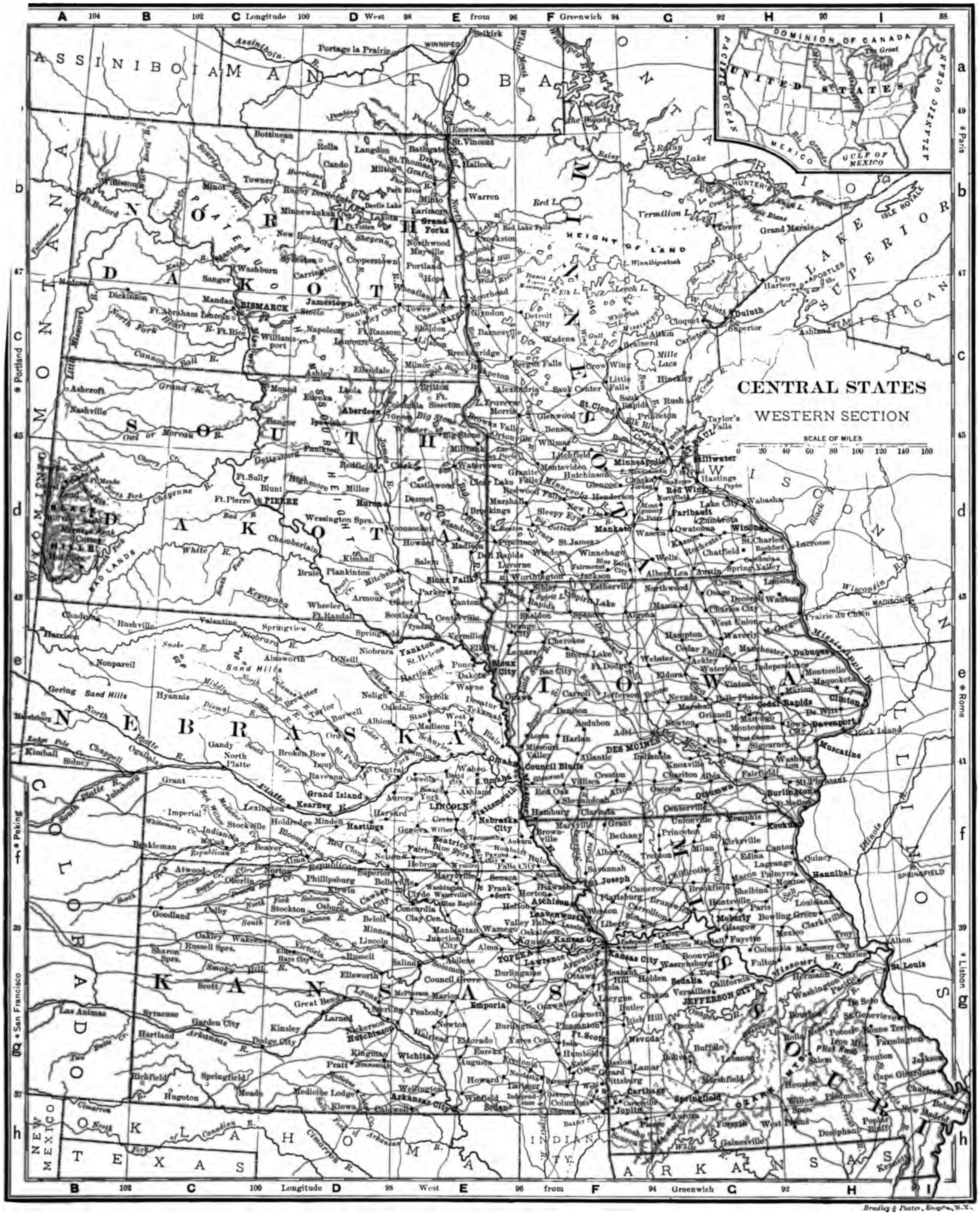
Bradley & Poates, Engr's, N.Y.



CENTRAL STATES

EASTERN SECTION

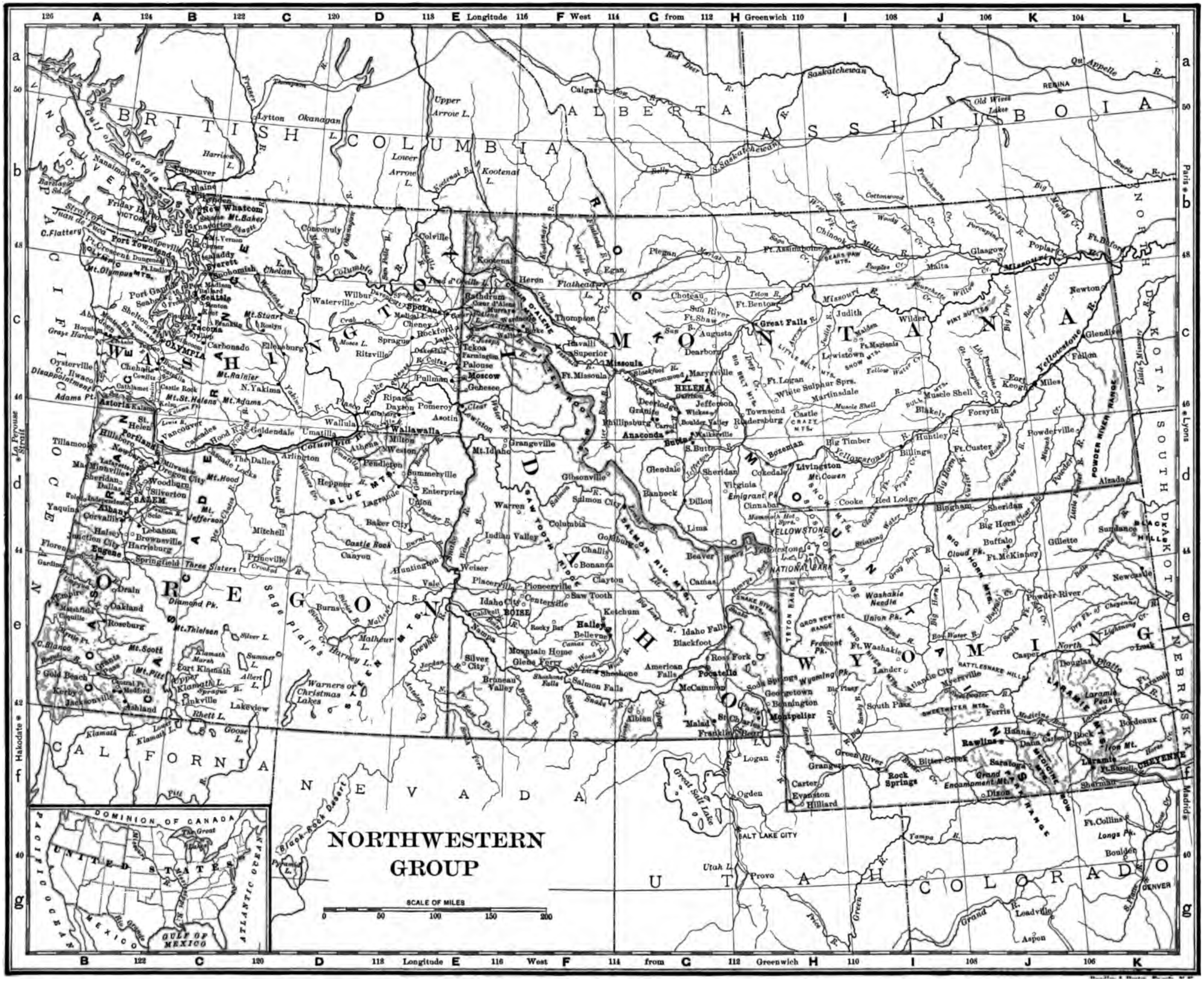
Bradley & Poates, Engr's, N.Y.



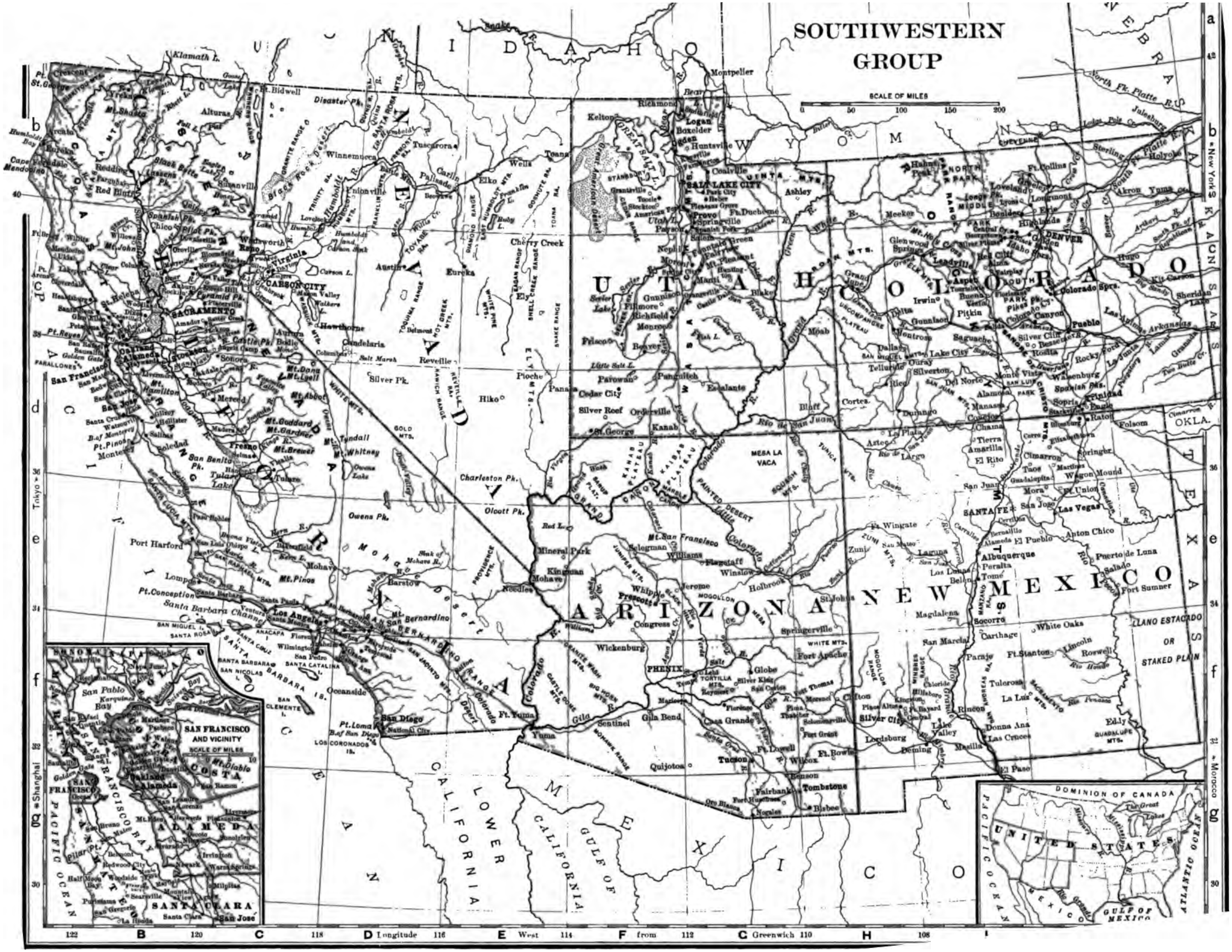
CENTRAL STATES

WESTERN SECTION

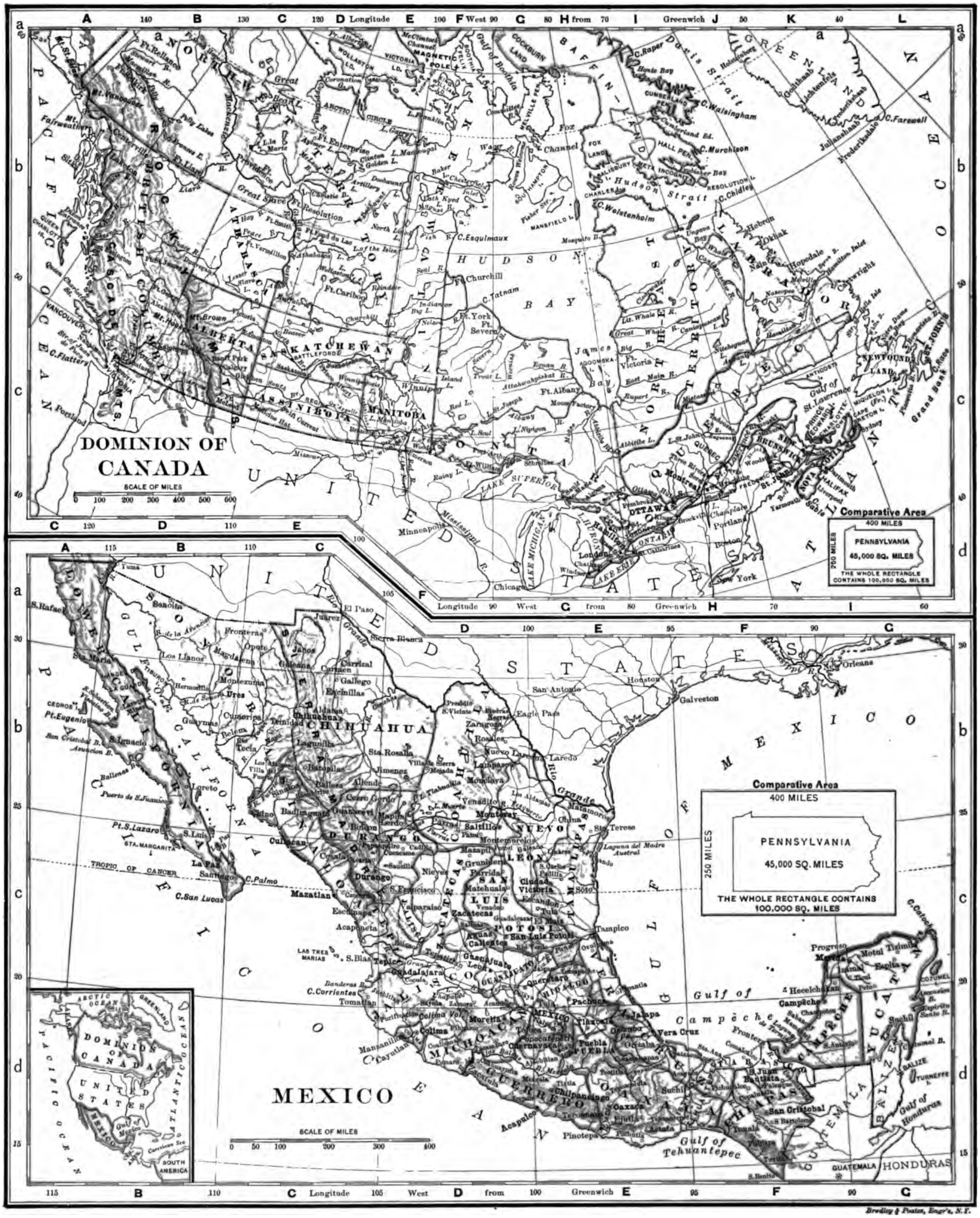
Bradley & Poates, Engr's, N.Y.



NORTHWESTERN GROUP



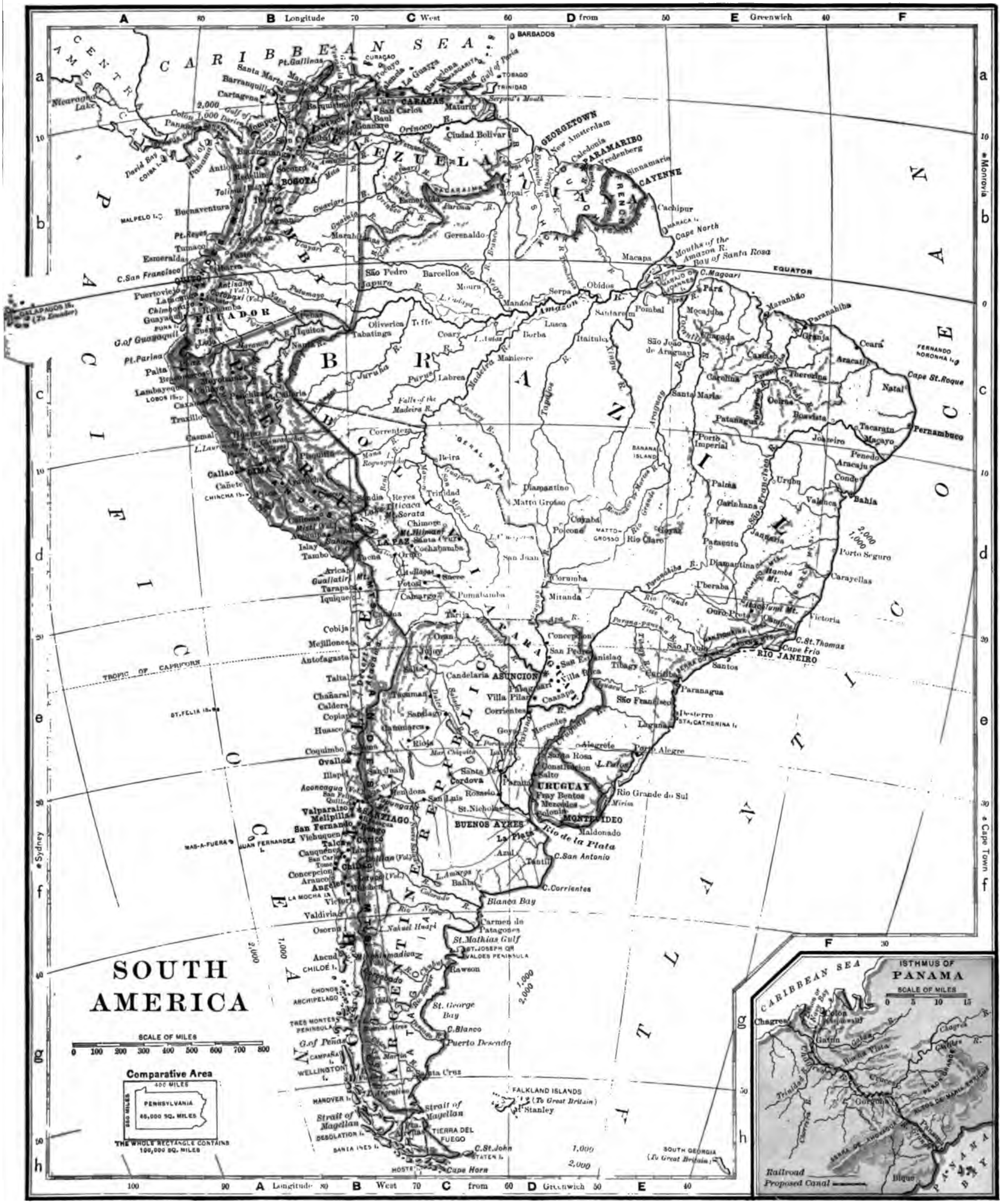
SOUTHWESTERN GROUP

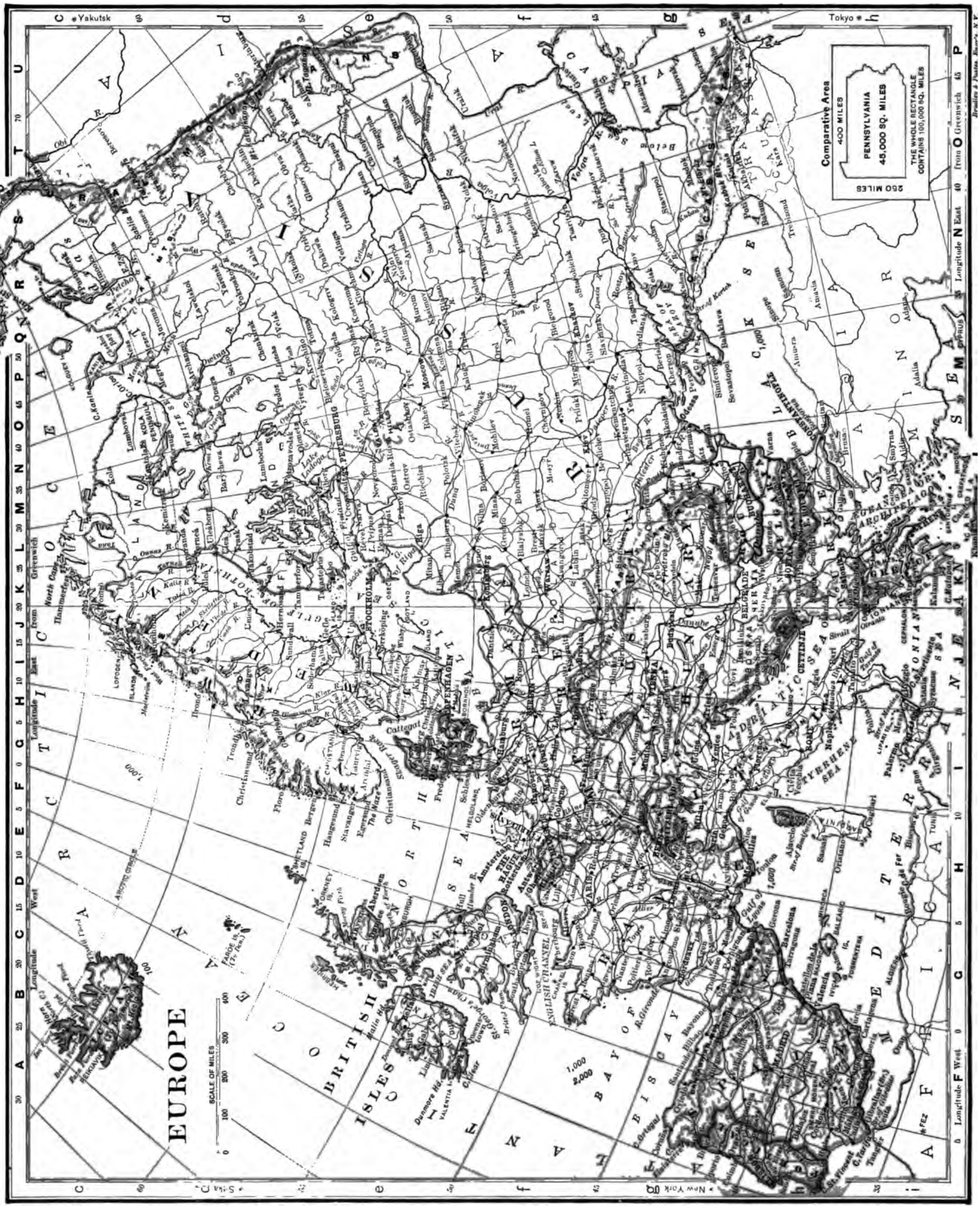


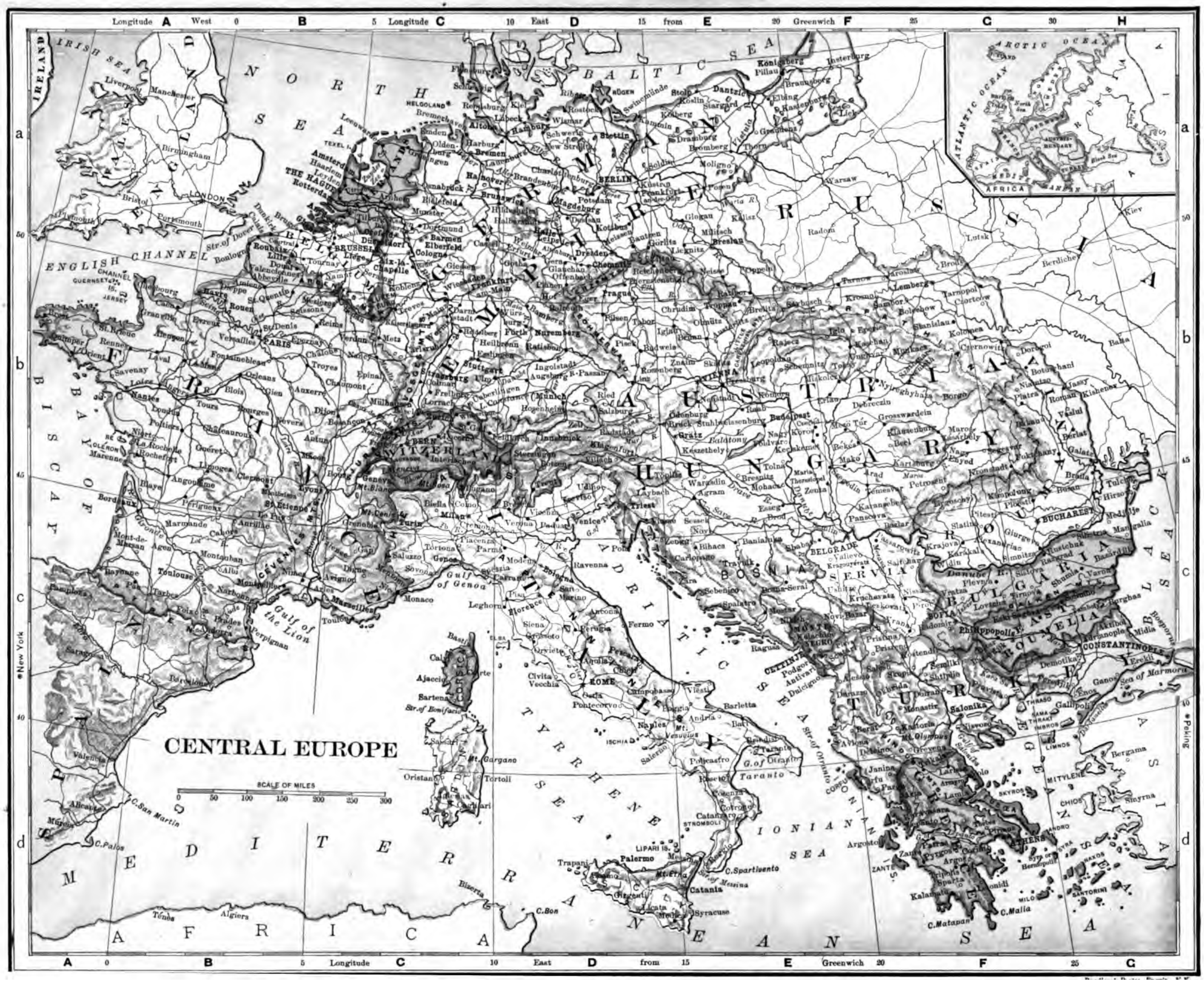
DOMINION OF CANADA

MEXICO

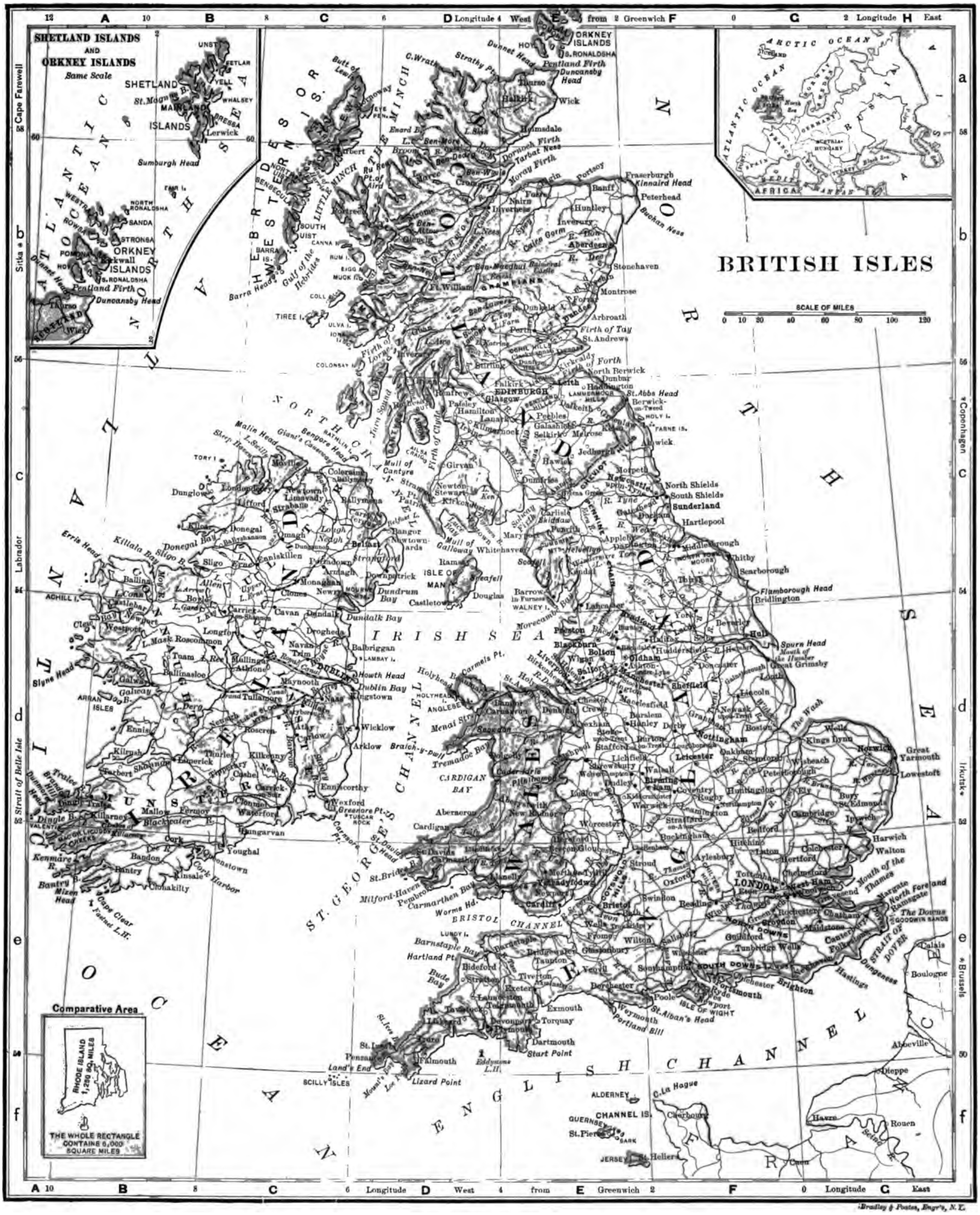
Bradley & Poates, Engr's, N.Y.


SOUTH AMERICA
SCALE OF MILES
0 100 200 300 400 500 600 700 800
Comparative Area
PENNSYLVANIA 45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
Longitude West from Greenwich
CARIBBEAN SEA
PACIFIC OCEAN
ATLANTIC OCEAN
COLOMBIA
VENEZUELA
GUIANA
ECUADOR
PERU
BRAZIL
BOLIVIA
CHILE
PARAGUAY
URUGUAY
ARGENTINE REPUBLIC
PATAGONIA
EQUATOR
TROPIC OF CAPRICORN
BOGOTA
CARACAS
GEORGETOWN
PARAMARIBO
CAYENNE
QUITO
LIMA
LA PAZ
ASUNCION
MONTEVIDEO
BUENOS AYRES
SANTIAGO
RIO JANEIRO
FALKLAND ISLANDS (To Great Britain)
Strait of Magellan
TIERRA DEL FUEGO
Cape Horn
Monrovia
Cape Town
Sydney
ISTHMUS OF PANAMA
SCALE OF MILES
0 5 10 15
Railroad
Proposed Canal

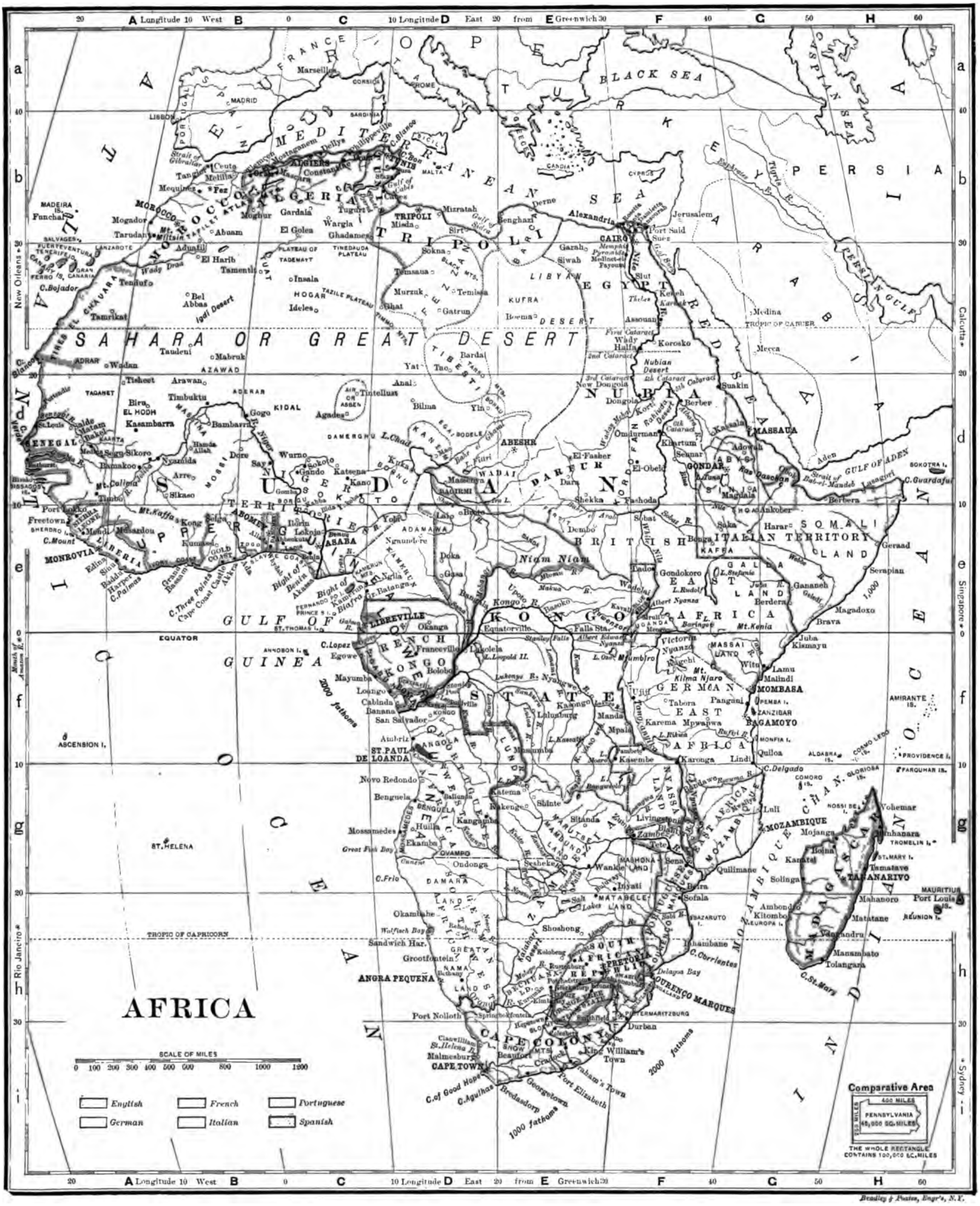

EUROPE
SCALE OF MILES
0 100 200 300 400
Comparative Area
400 MILES
PENNSYLVANIA
45,000 SQ. MILES
THE WHOLE RECTANGLE CONTAINS 100,000 SQ. MILES
250 MILES
ARCTIC OCEAN
NORTH SEA
BAY OF BISCAY
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
BRITISH ISLES
ATLANTIC OCEAN
Bradley & Poates, Engr's, N.Y.



CENTRAL EUROPE



iBradley & Poates, Engr's, N.Y.



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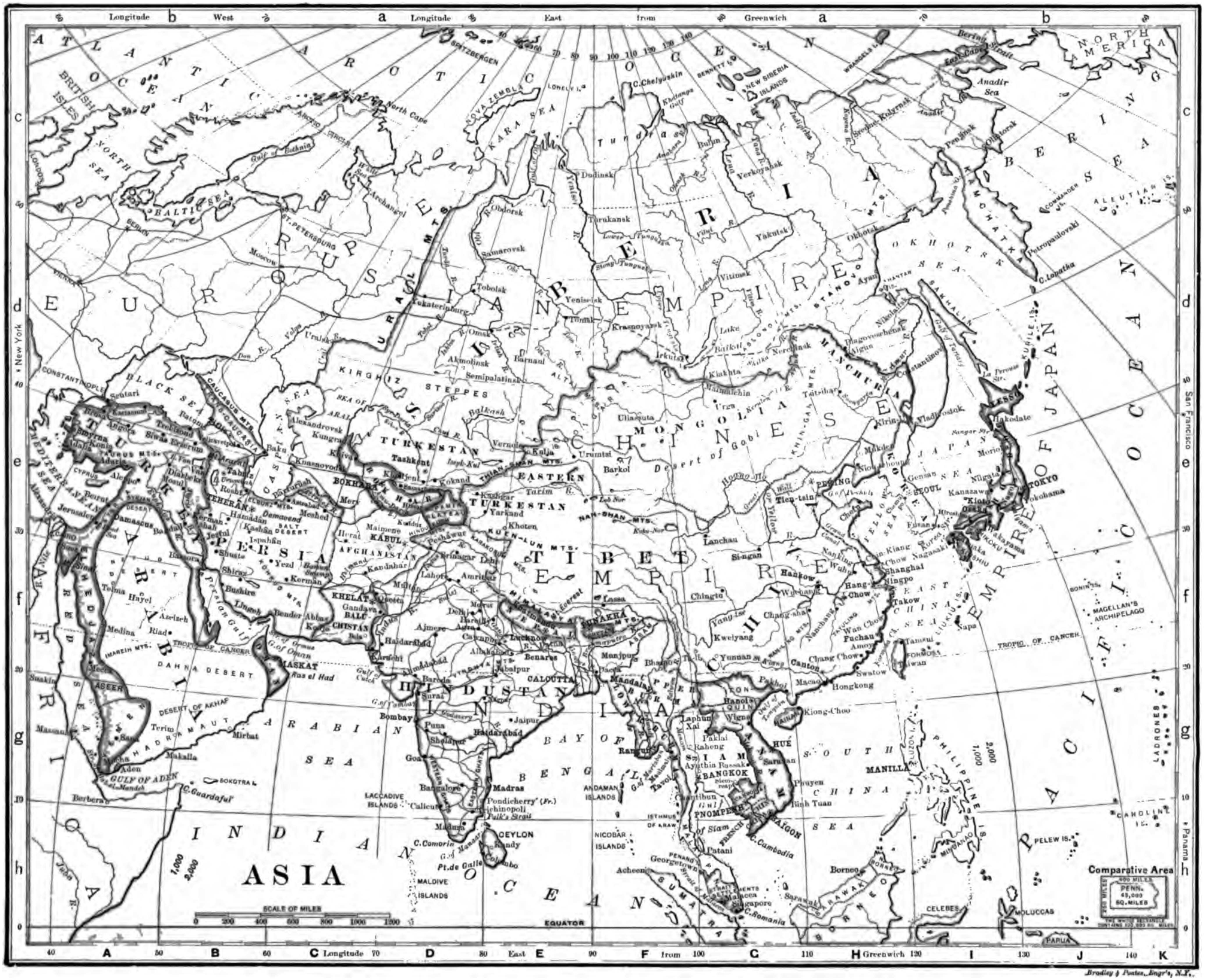

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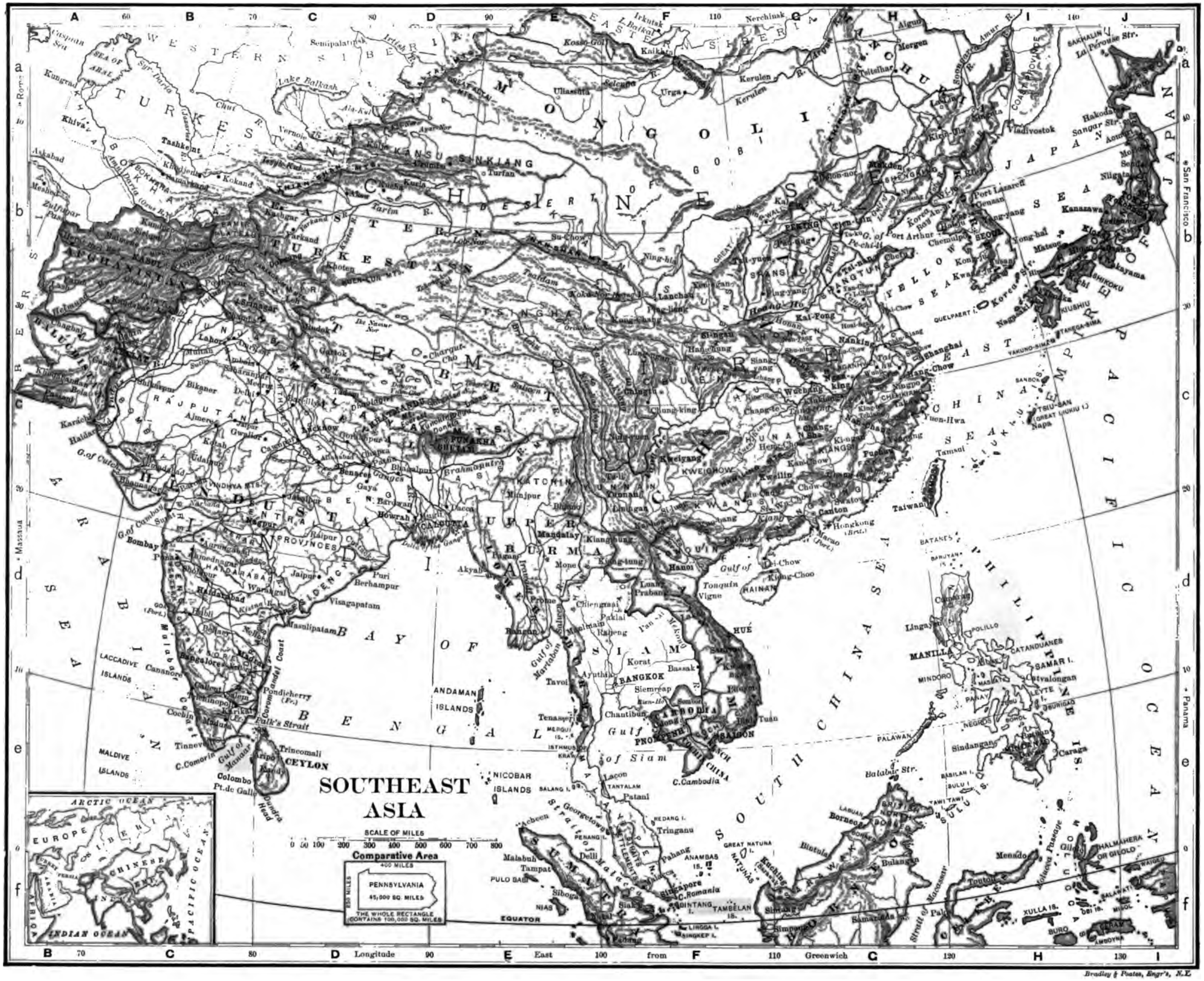

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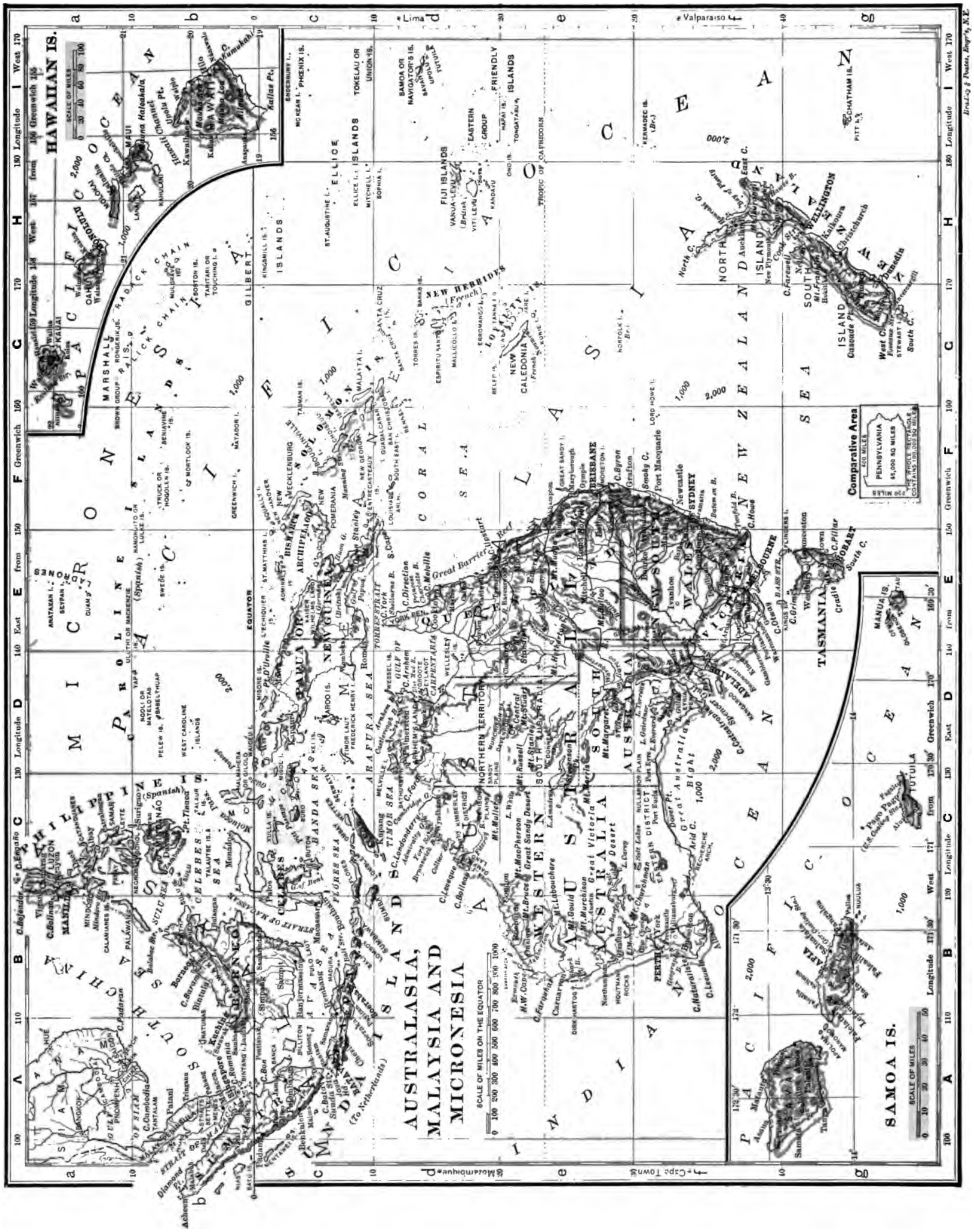
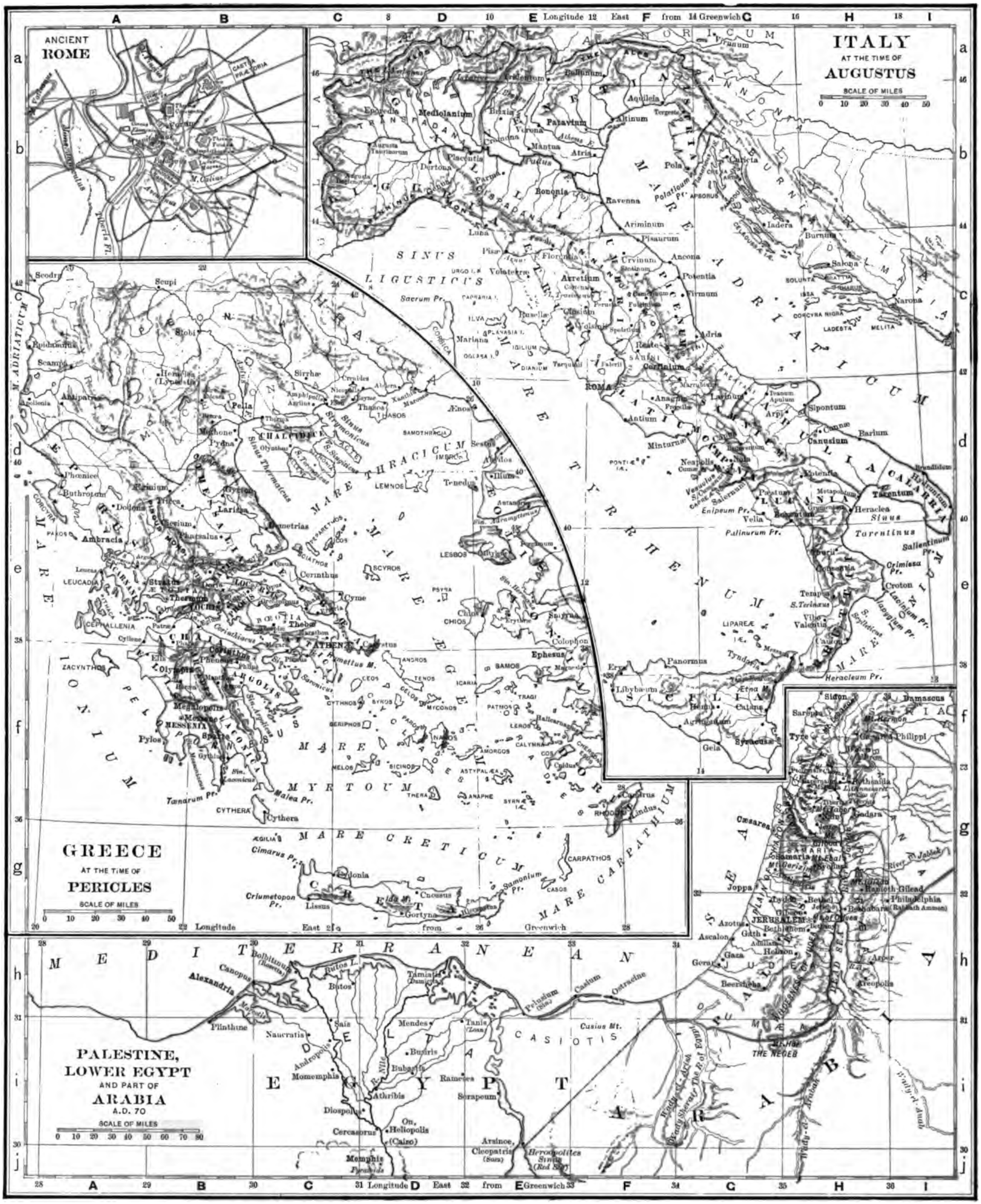


# AUSTRALASIA, MALAYSIA AND MICRONESIA


ANCIENT
ROME
ITALY
AT THE TIME OF
AUGUSTUS
SCALE OF MILES
0 10 20 30 40 50
GREECE
AT THE TIME OF
PERICLES
SCALE OF MILES
0 10 20 30 40 50
PALESTINE,
LOWER EGYPT
AND PART OF
ARABIA
A.D. 70
SCALE OF MILES
0 10 20 30 40 50 60 70 80
Longitude 12 East from 14 Greenwich
22 Longitude East from 26 Greenwich
31 Longitude East 32 from Greenwich 33
A
B
C
D
E
F
G
H
I
a
b
c
d
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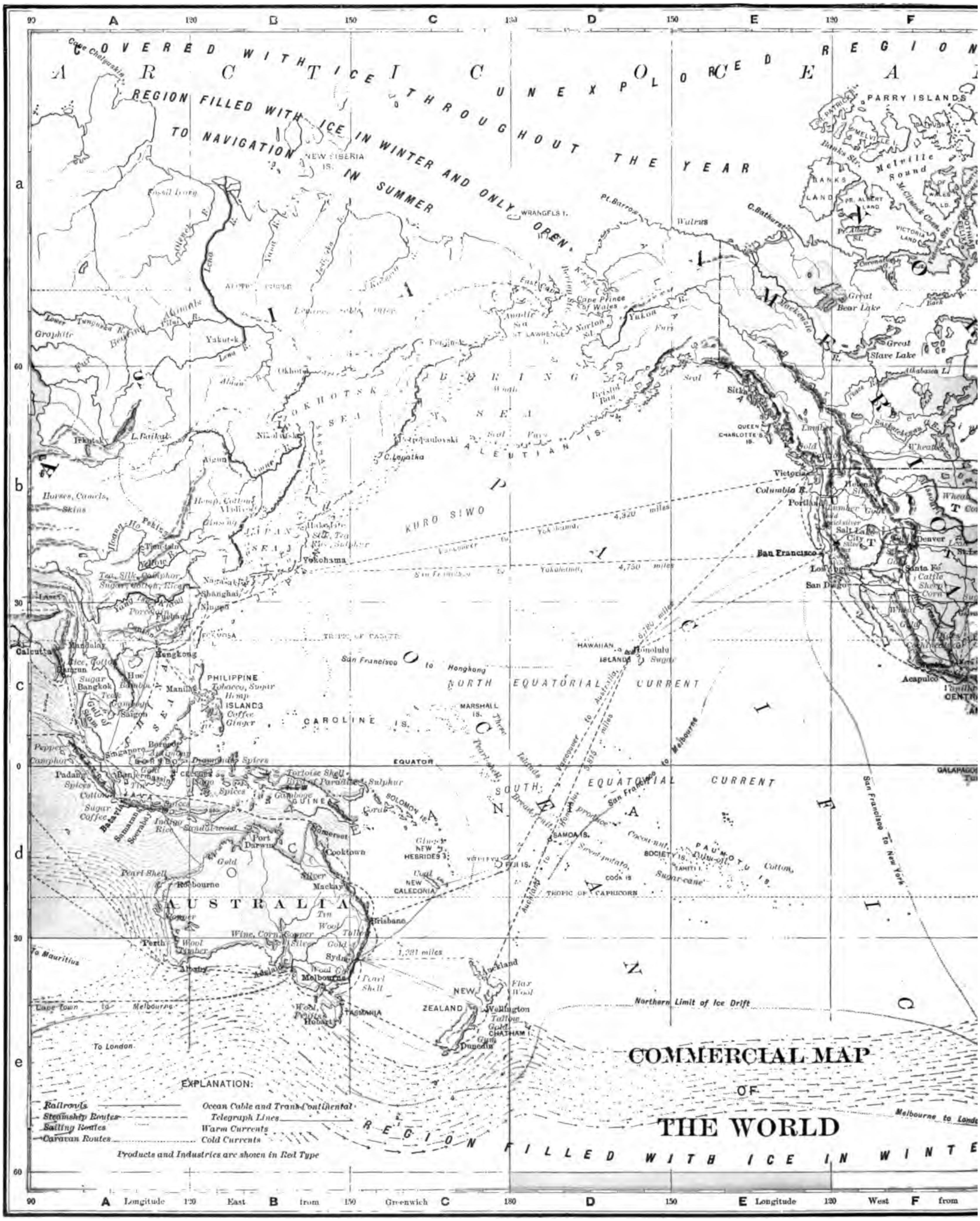
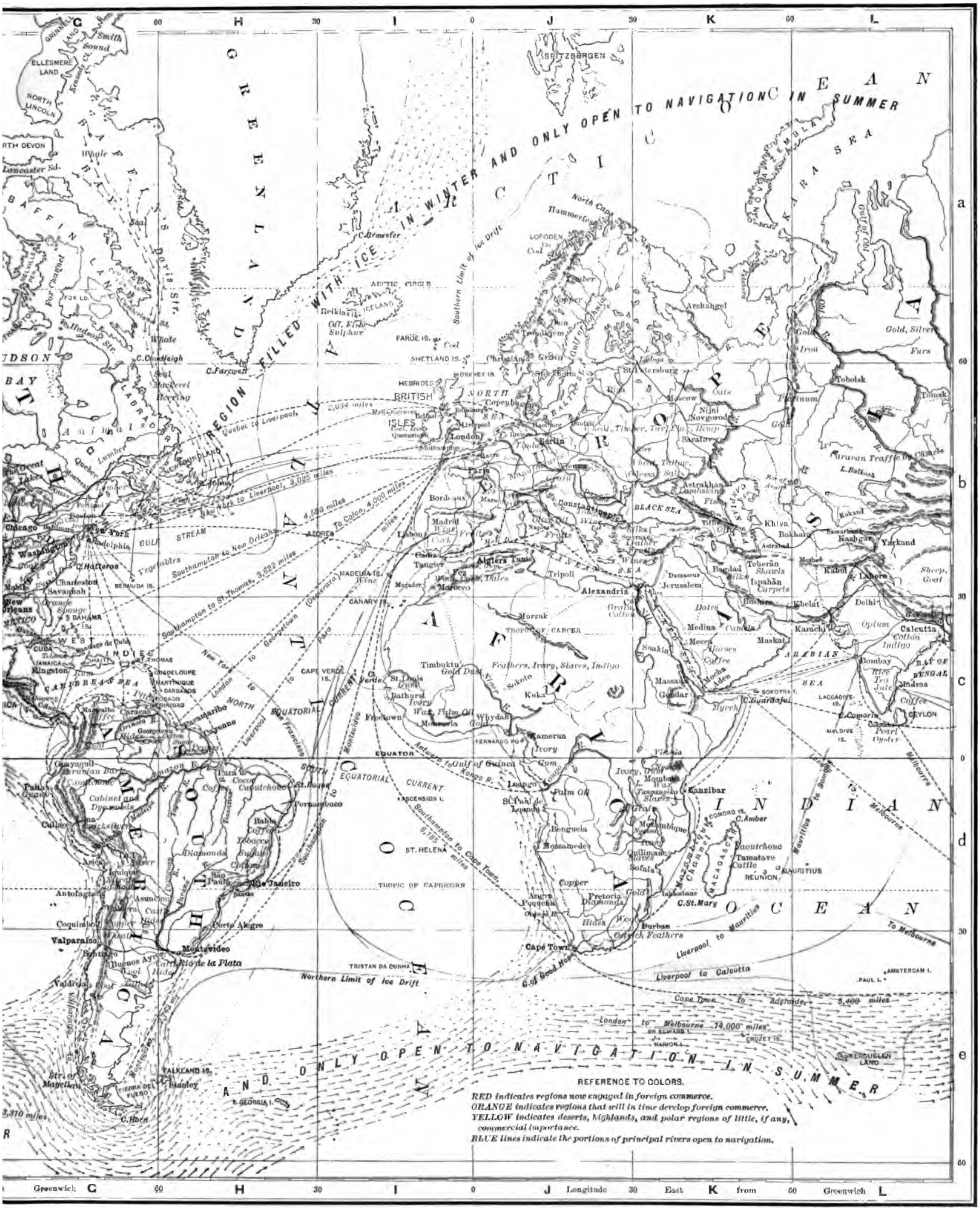
f
g
h
i
j
SINUS LIGUSTICUS
MARE TYRRHENUM
MARE ADRIATICUM
MARE THRACICUM
MARE AEGAEUM
MARE MYRTOUM
MARE CRETICUM
MARE CARPATHIUM
MARE IONIUM
M. ADRIATICUM
MEDITERRANEAN
SICILIA
CORSICA
SARDINIA
ROMA
Mediolanum
Patavium
Aquileia
Ravenna
Bononia
Ariminum
Ancona
Neapolis
Tarentum
Brundisium
Syracusae
Panormus
CALABRIA
LUCANIA
APULIA
LATIUM
CAMPANIA
ETRURIA
UMBRIA
PICENUM
ILLYRICUM
DALMATIA
PANNONIA
NORICUM
MACEDONIA
THRACIA
EPIRUS
THESSALIA
ACHAIA
ARGOLIS
LACONICA
MESSENIA
BOEOTIA
ATTICA
ATHENAE
Corinthus
Sparta
Thebae
Delphi
Olympia
Pella
Ephesus
Smyrna
Miletus
CRETA
Cnossus
Gortyna
Cydonia
Rhodus
LESBOS
CHIOS
SAMOS
LEMNOS
EUBOEA
CYTHERA
CORCYRA
ZACYNTHOS
CEPHALLENIA
LEUCADIA
Sidon
Tyre
Damascus
Caesarea
Joppa
JERUSALEM
Bethlehem
Hebron
Gaza
Ascalon
Azotus
Beersheba
SAMARIA
JUDAEA
GALILAEA
MOAB
THE NEGEB
ARABIA
AEGYPTUS
DELTA
CASIOTIS
Alexandria
Canopus
Naucratis
Sais
Memphis
On, Heliopolis (Cairo)
Pelusium
Tanis
Bubastis
Heroopolites Sinus (Red Sea)



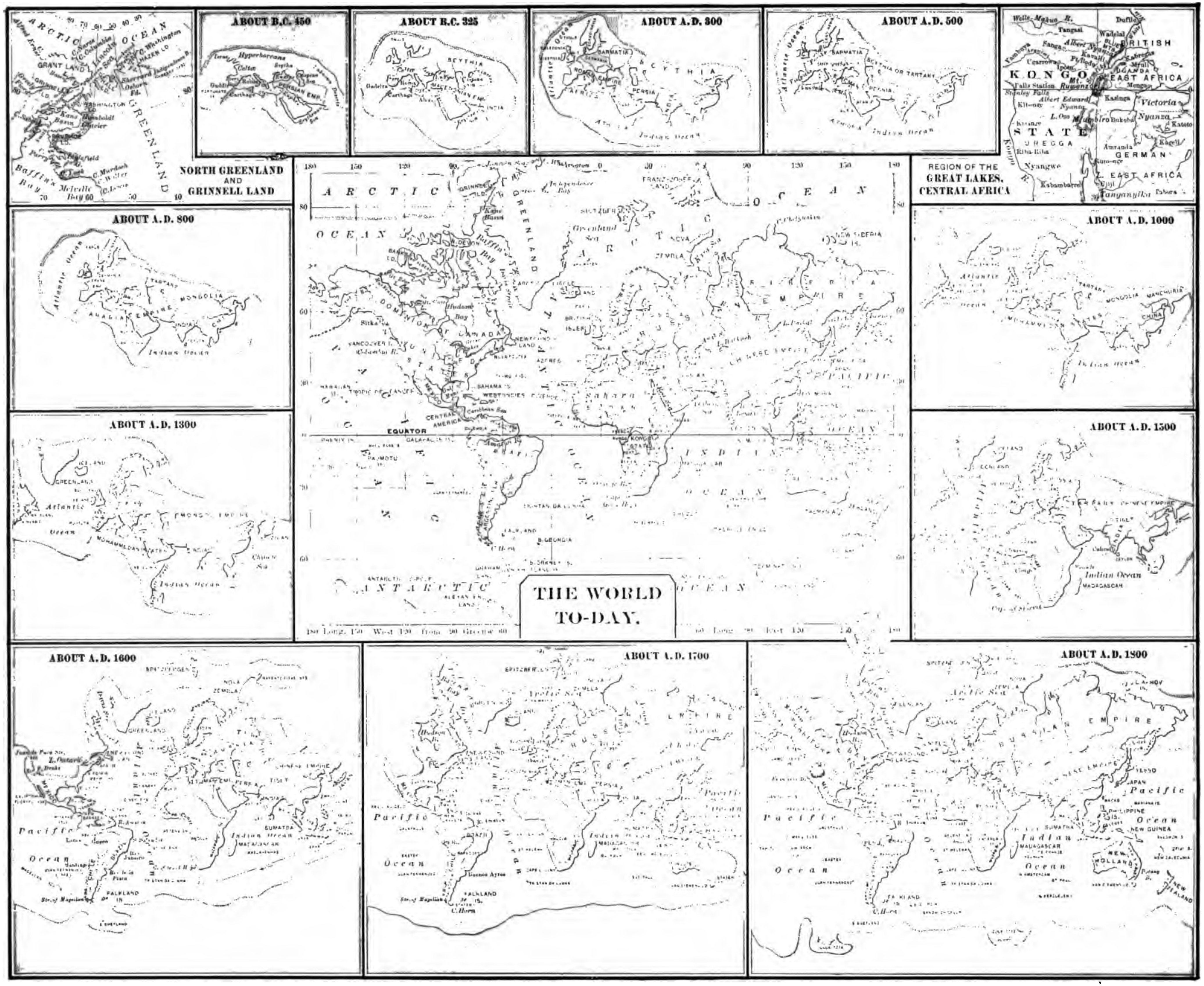
COMMERCIAL MAP OF THE WORLD



REFERENCE TO COLORS.

*RED indicates regions now engaged in foreign commerce.*
*ORANGE indicates regions that will in time develop foreign commerce.*
*YELLOW indicates deserts, highlands, and polar regions of little, if any, commercial importance.*
*BLUE lines indicate the portions of principal rivers open to navigation.*

*Bradley & Poates, Engr's, N.Y.*


NORTH GREENLAND AND GRINNELL LAND
ABOUT B.C. 450
ABOUT B.C. 325
ABOUT A.D. 300
ABOUT A.D. 500
REGION OF THE GREAT LAKES, CENTRAL AFRICA
ABOUT A.D. 800
ABOUT A.D. 1000
ABOUT A.D. 1300
ABOUT A.D. 1500
THE WORLD TO-DAY.
ABOUT A.D. 1600
ABOUT A.D. 1700
ABOUT A.D. 1800
ARCTIC OCEAN
GREENLAND
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
ANTARCTIC OCEAN
EQUATOR
KONGO STATE
BRITISH EAST AFRICA
GERMAN EAST AFRICA
Victoria Nyanza
Tanganyika
Baffin's Bay
SCYTHIA
SARMATIA
PERSIA
INDIA
MONGOLIA
CHINA
MUHAMMEDAN STATES
RUSSIAN EMPIRE
CHINESE EMPIRE
Long. West from Greenw Long. East

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